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(12) **United States Patent**
Cauley

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(54) **FIREARM VISE**

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This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.**
F41C 27/00 (2006.01)

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(58) **Field of Classification Search** 42/94; 89/37.04, 89/41.17

See application file for complete search history.

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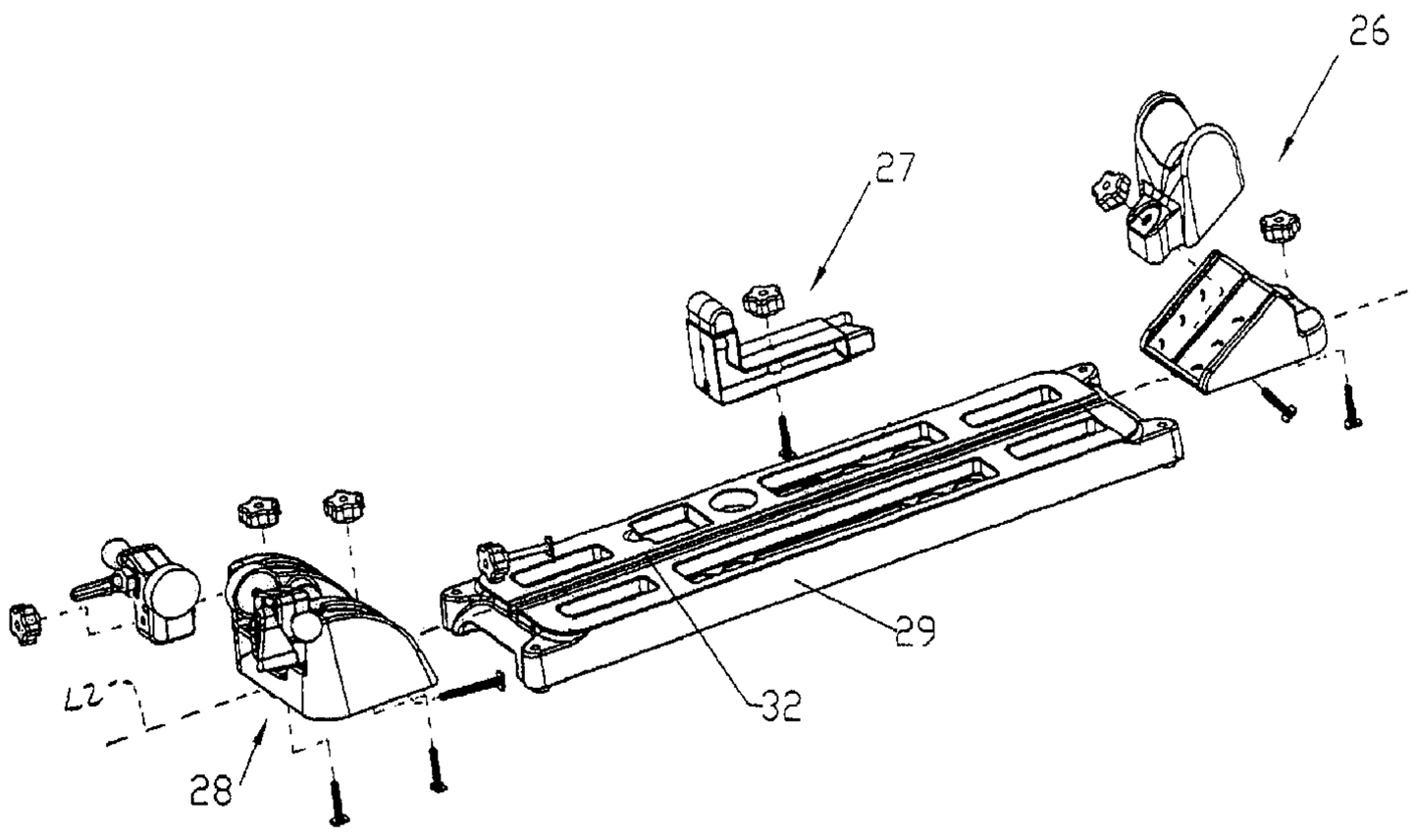
(57) **ABSTRACT**

A firearm holding device for holding a firearm having a forend, a grip and a buttstock. The holding device comprises a base having a longitudinal axis, a forend support mounted on the base for supporting the forend of the firearm, a grip support mounted on the base for supporting the grip of the firearm, and a buttstock support mounted on the base for supporting the buttstock of the firearm. At least one of the forend support, grip support and buttstock support are moveable on the base along the longitudinal axis of the base to accommodate various sizes and types of firearms.

8 Claims, 14 Drawing Sheets



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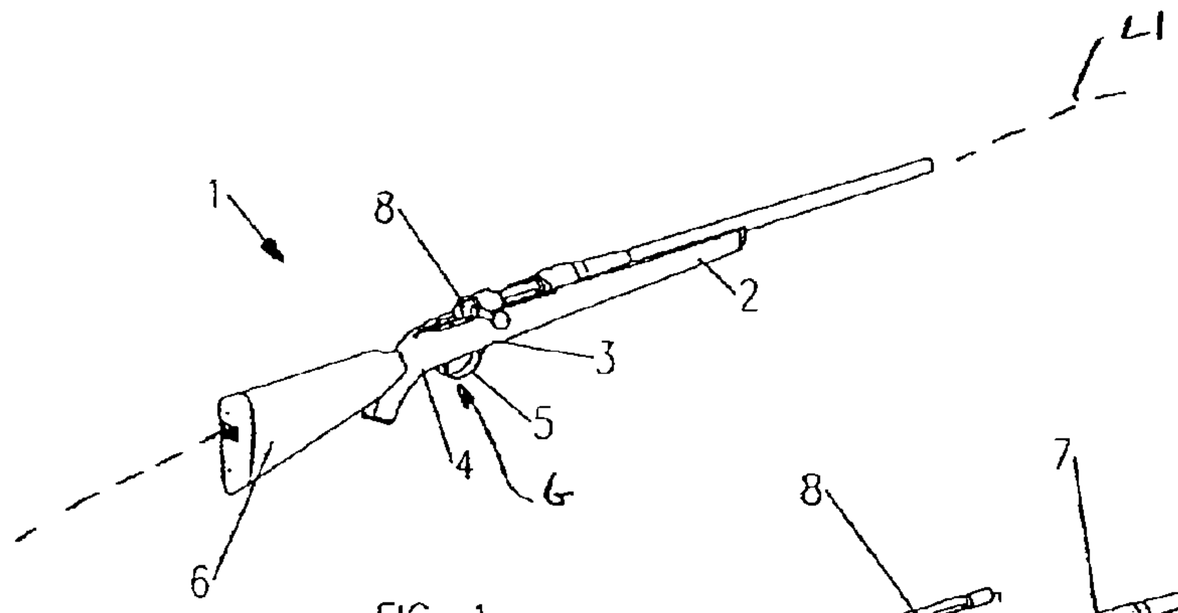


FIG. 1

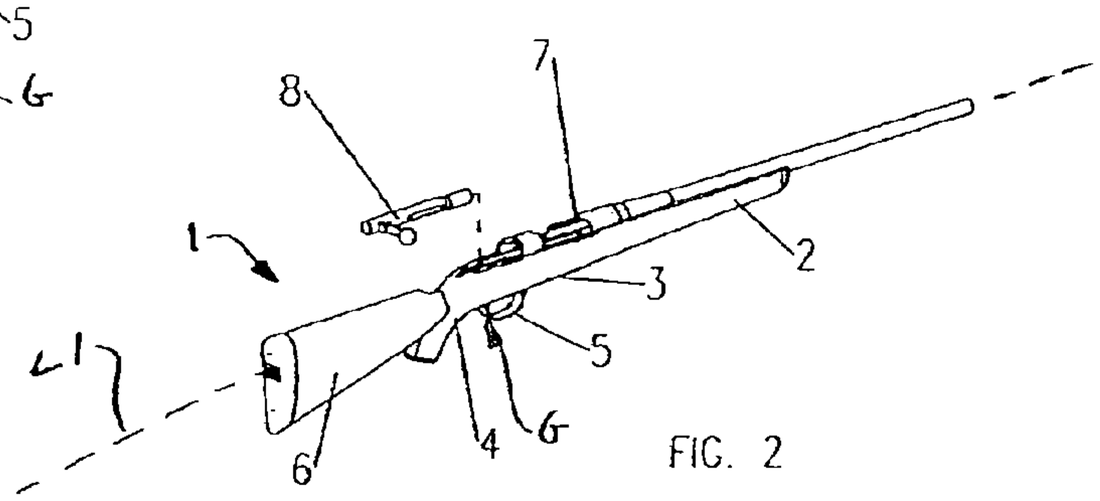
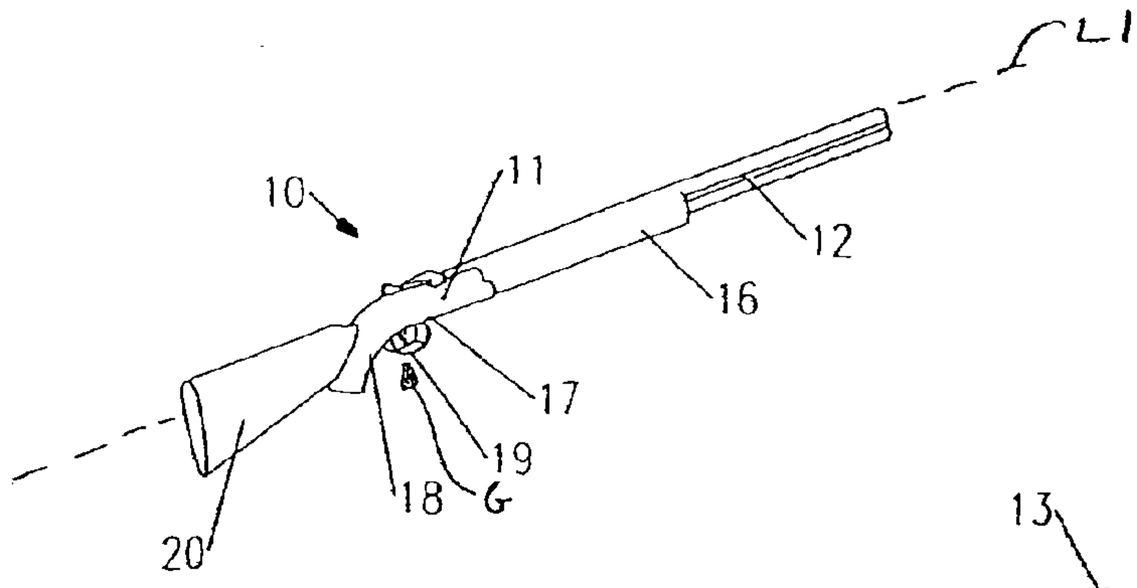


FIG. 2



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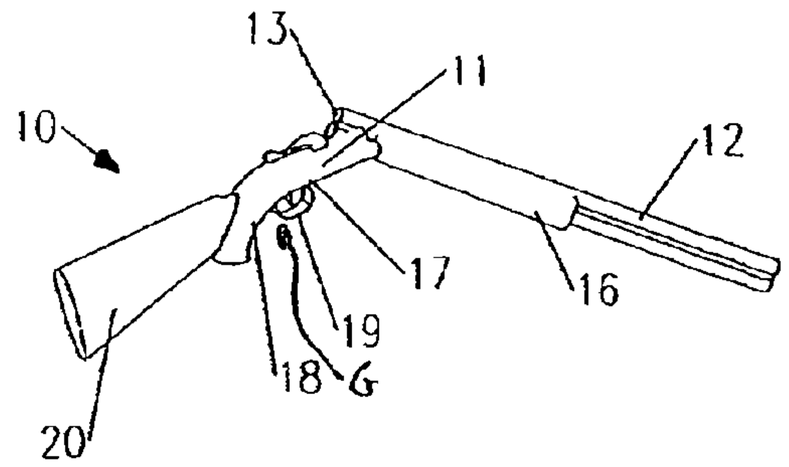


FIG. 4

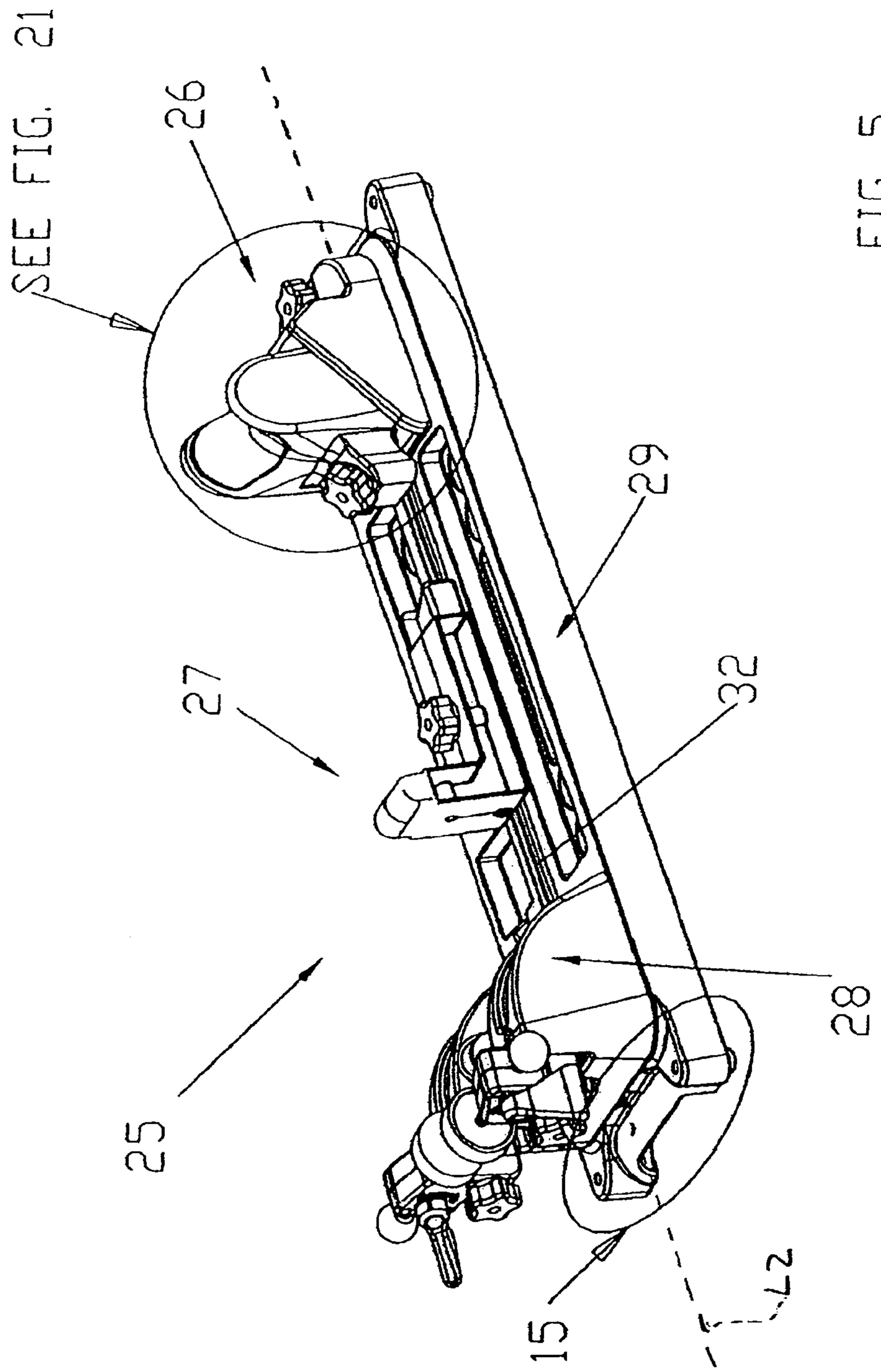
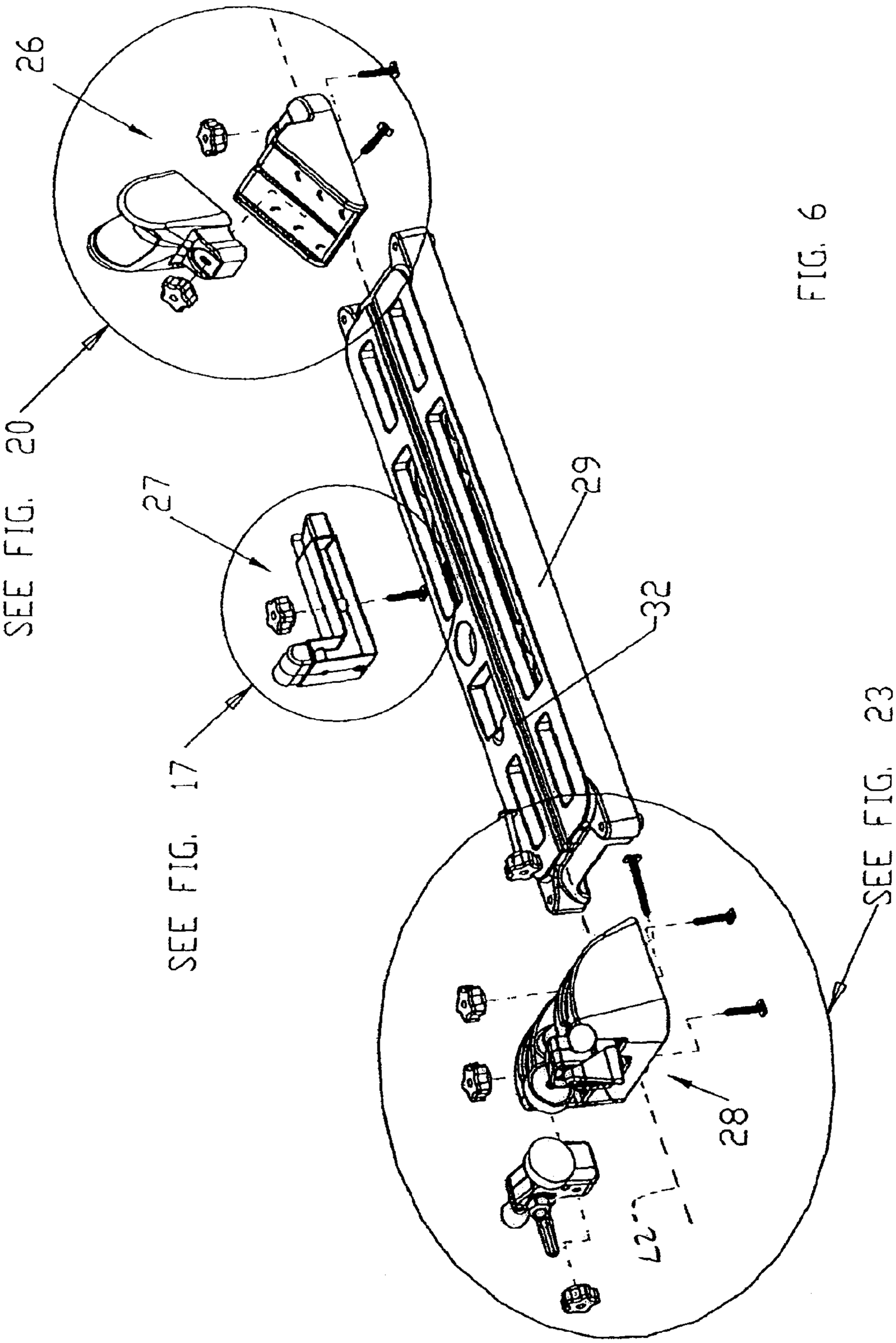


FIG. 5



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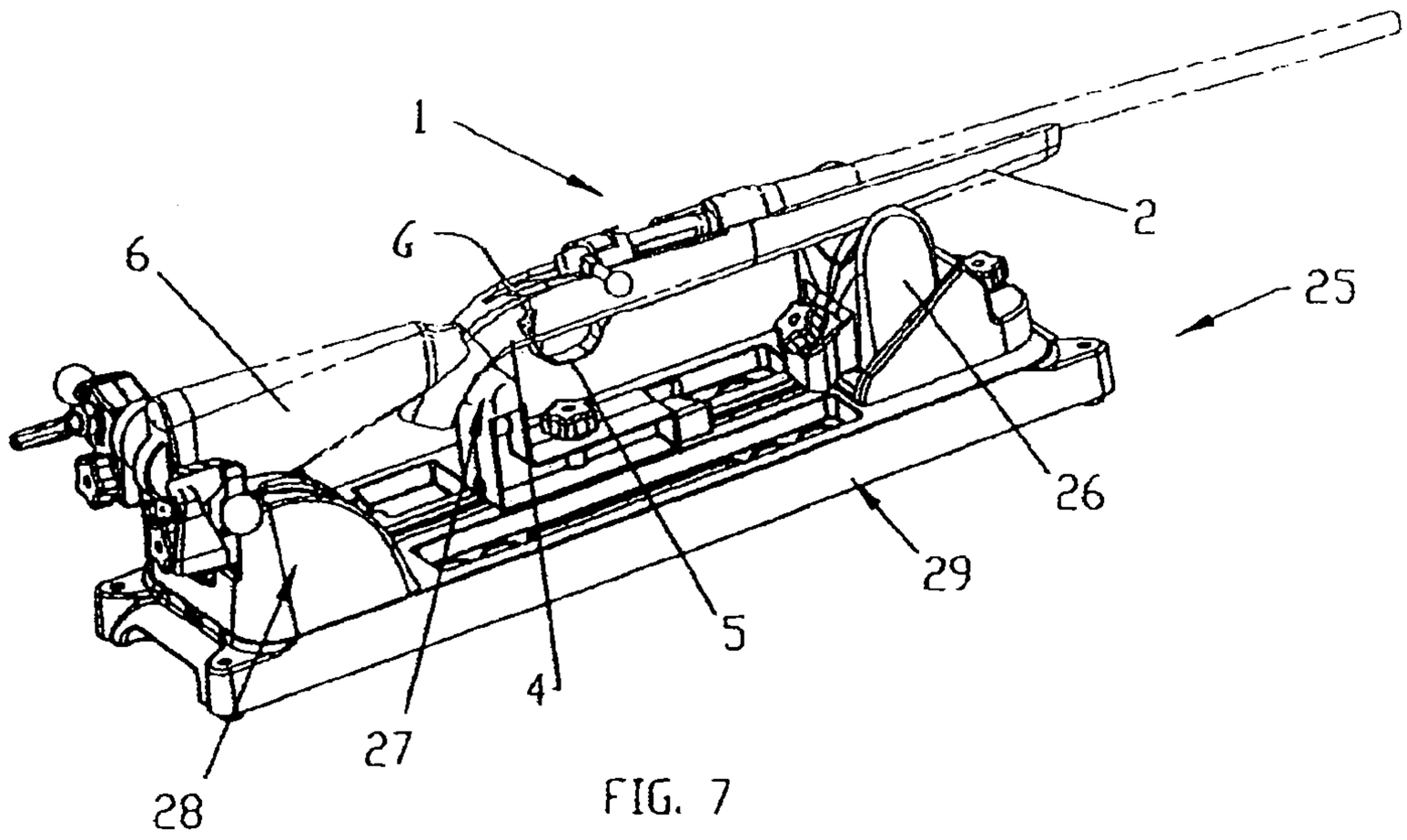

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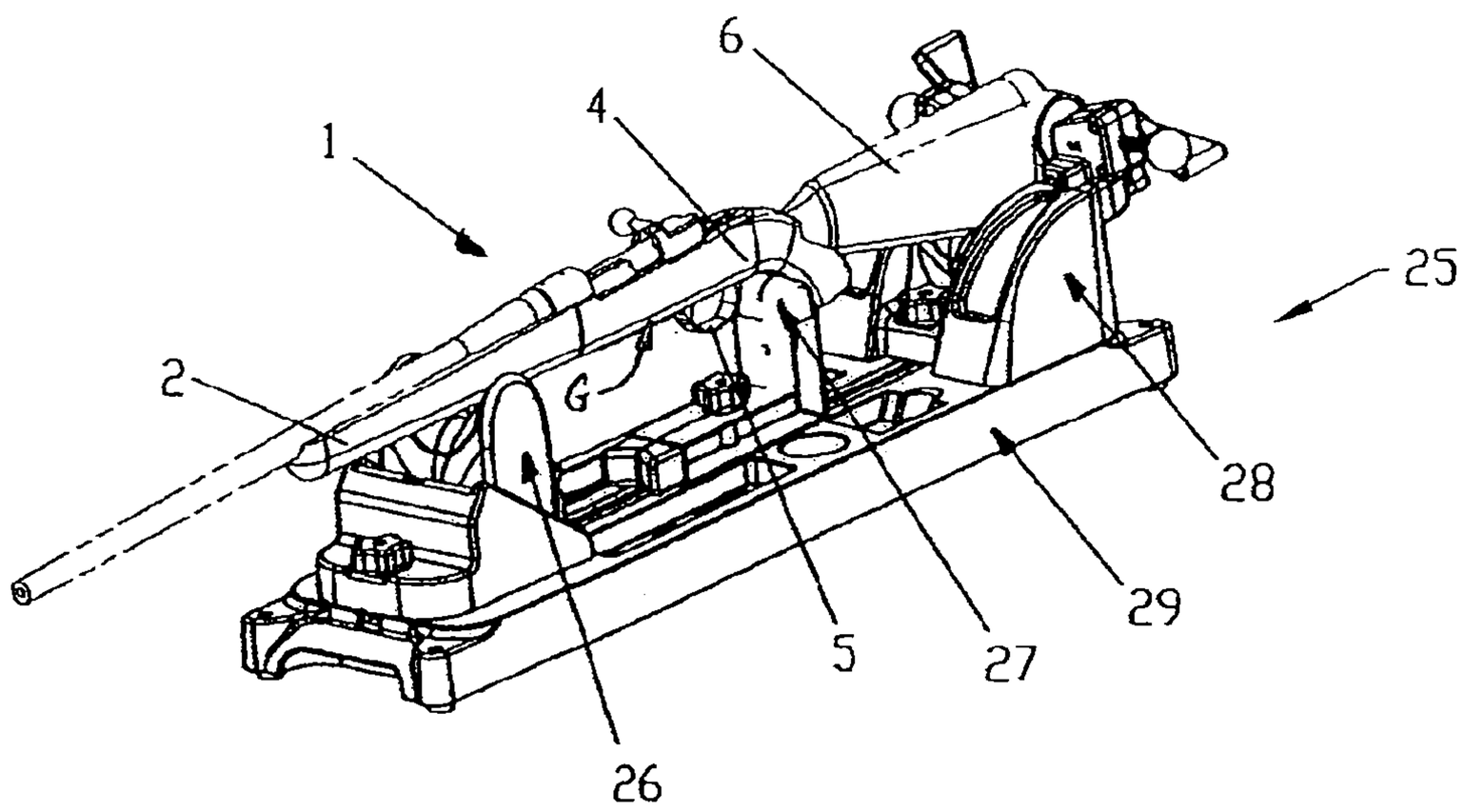

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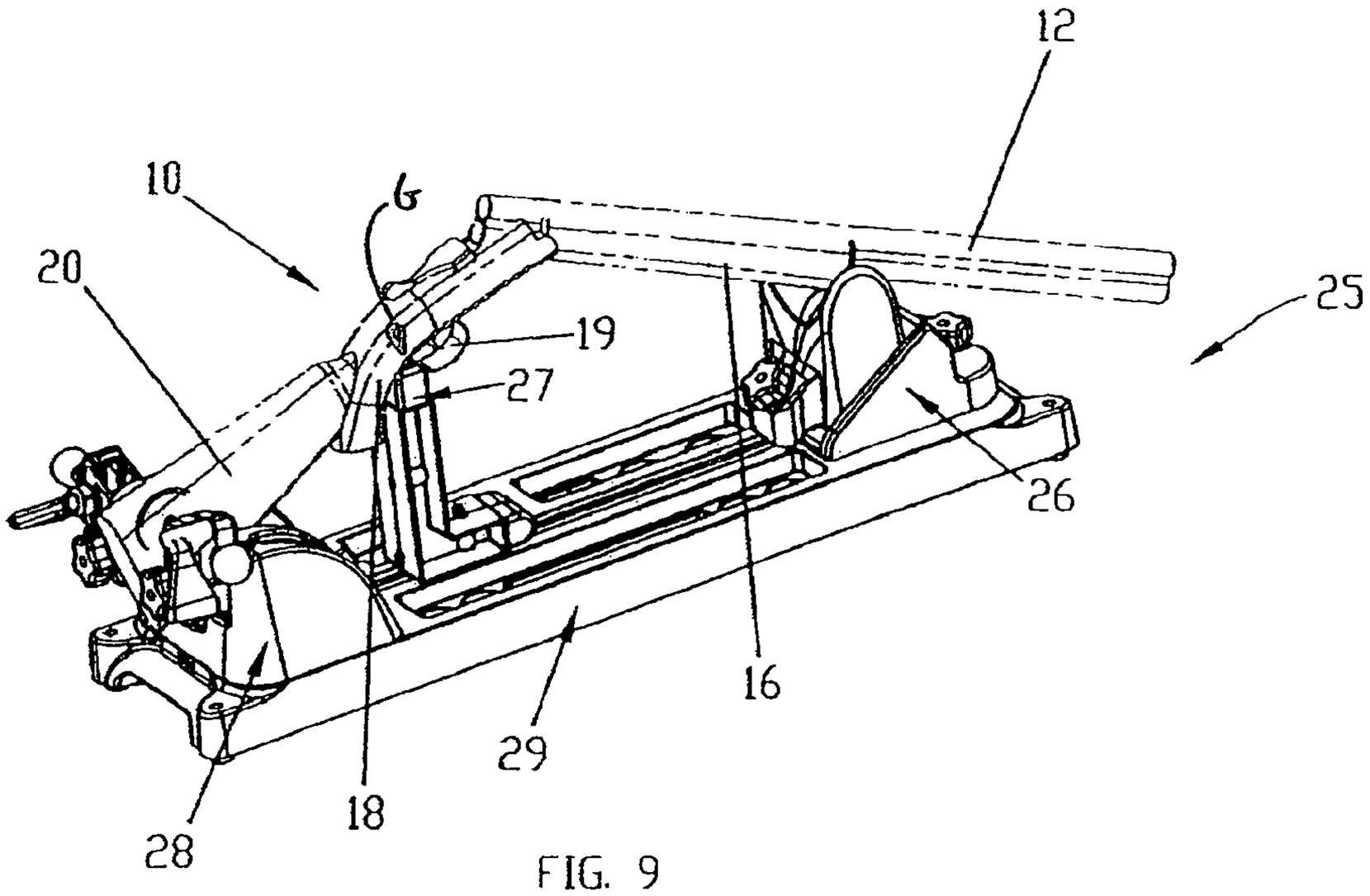

FIG. 9

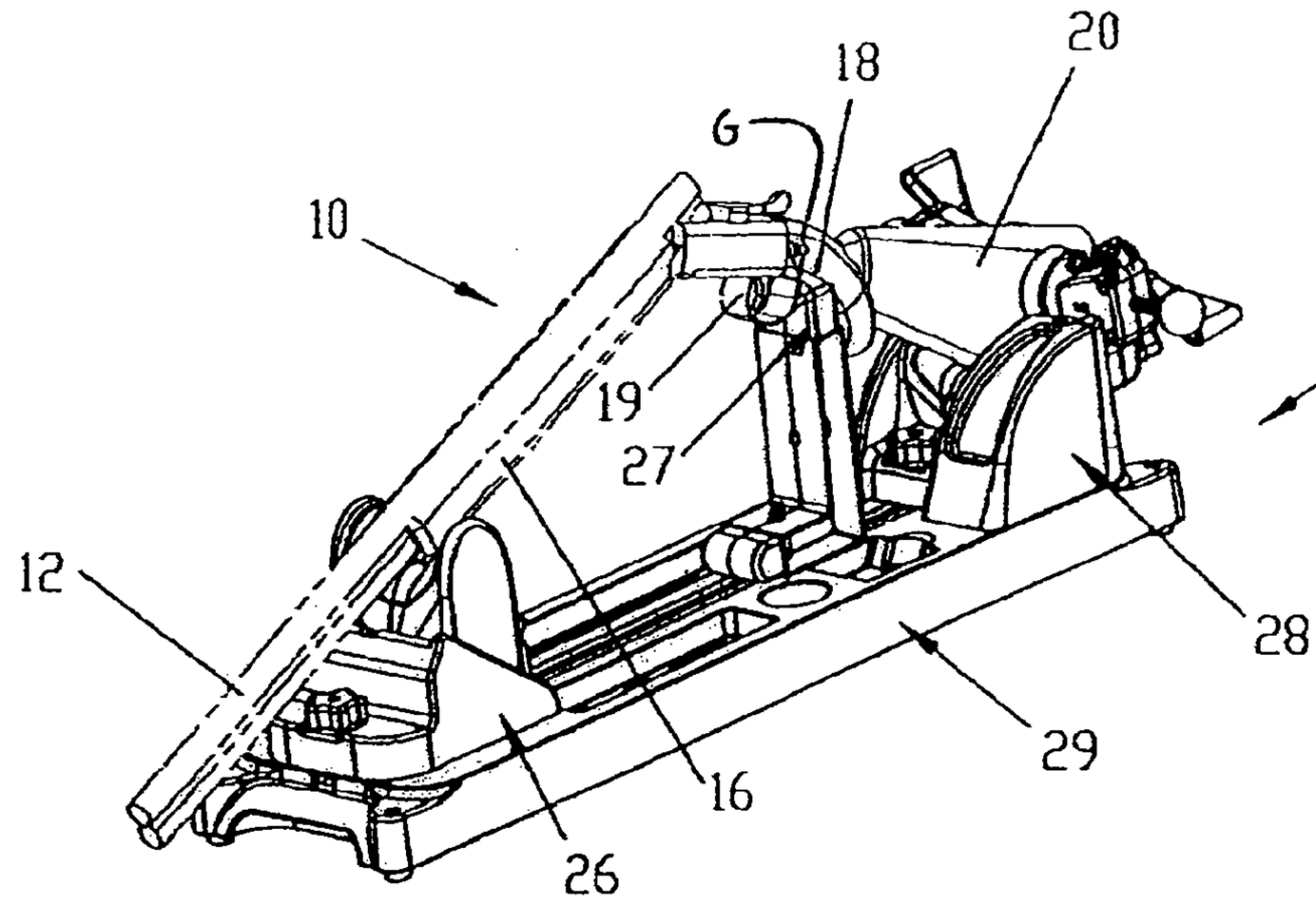

FIG. 10

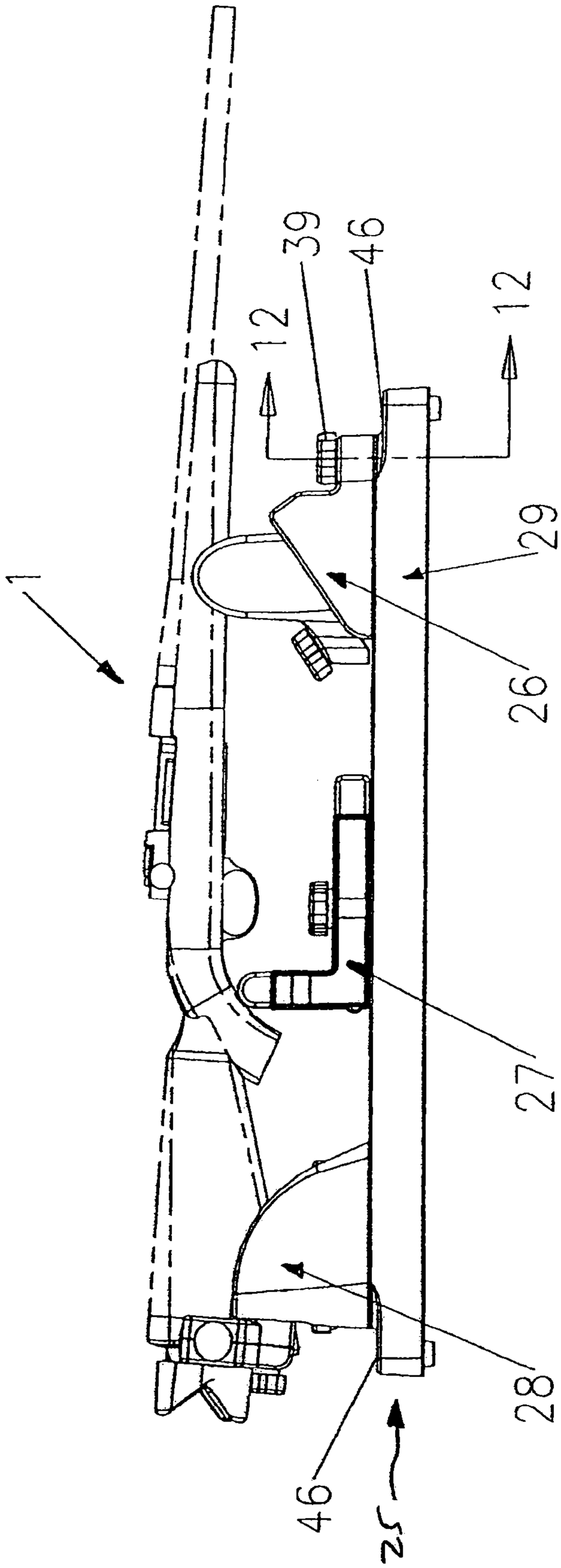

FIG. 11

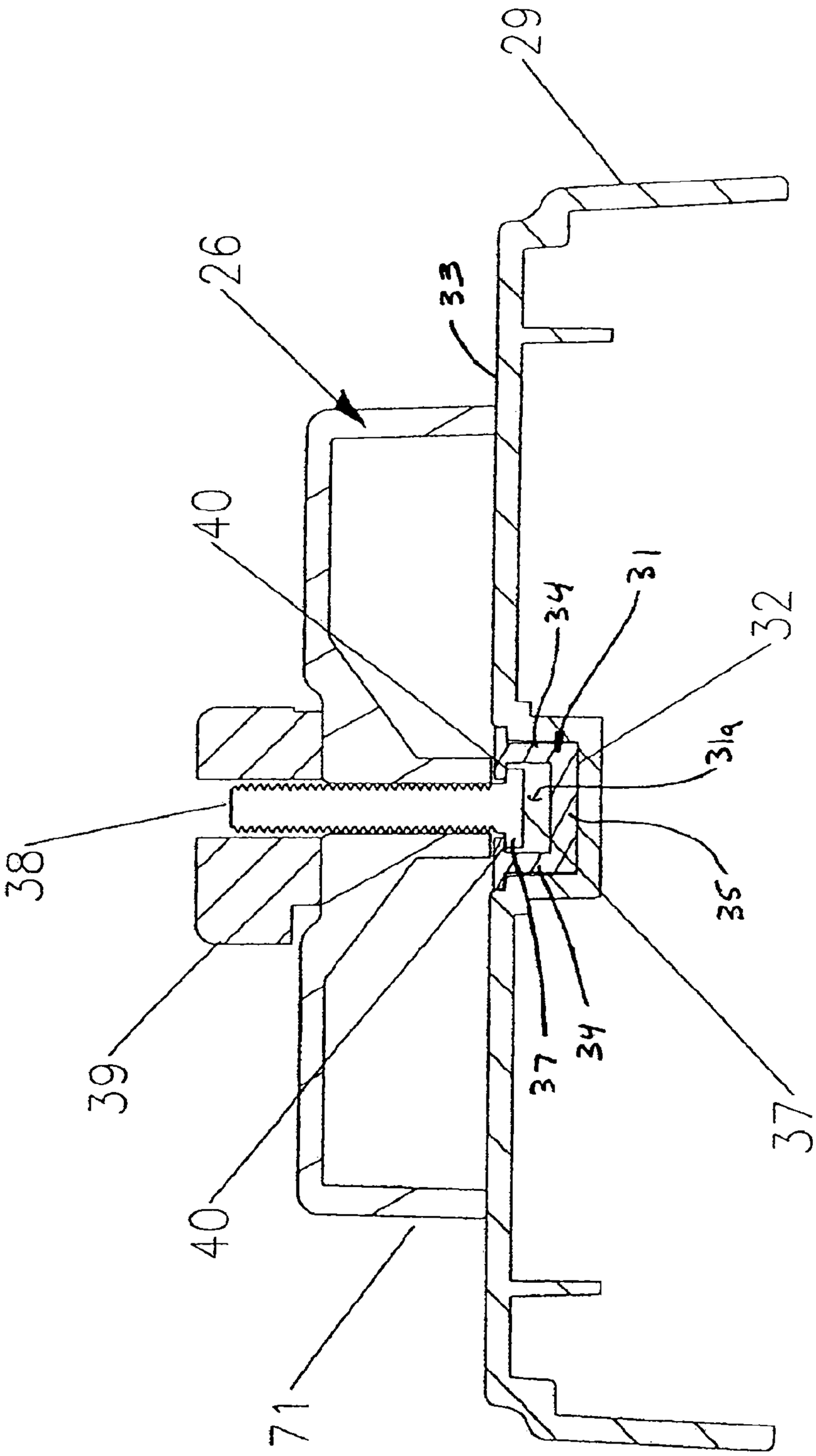

FIG. 12

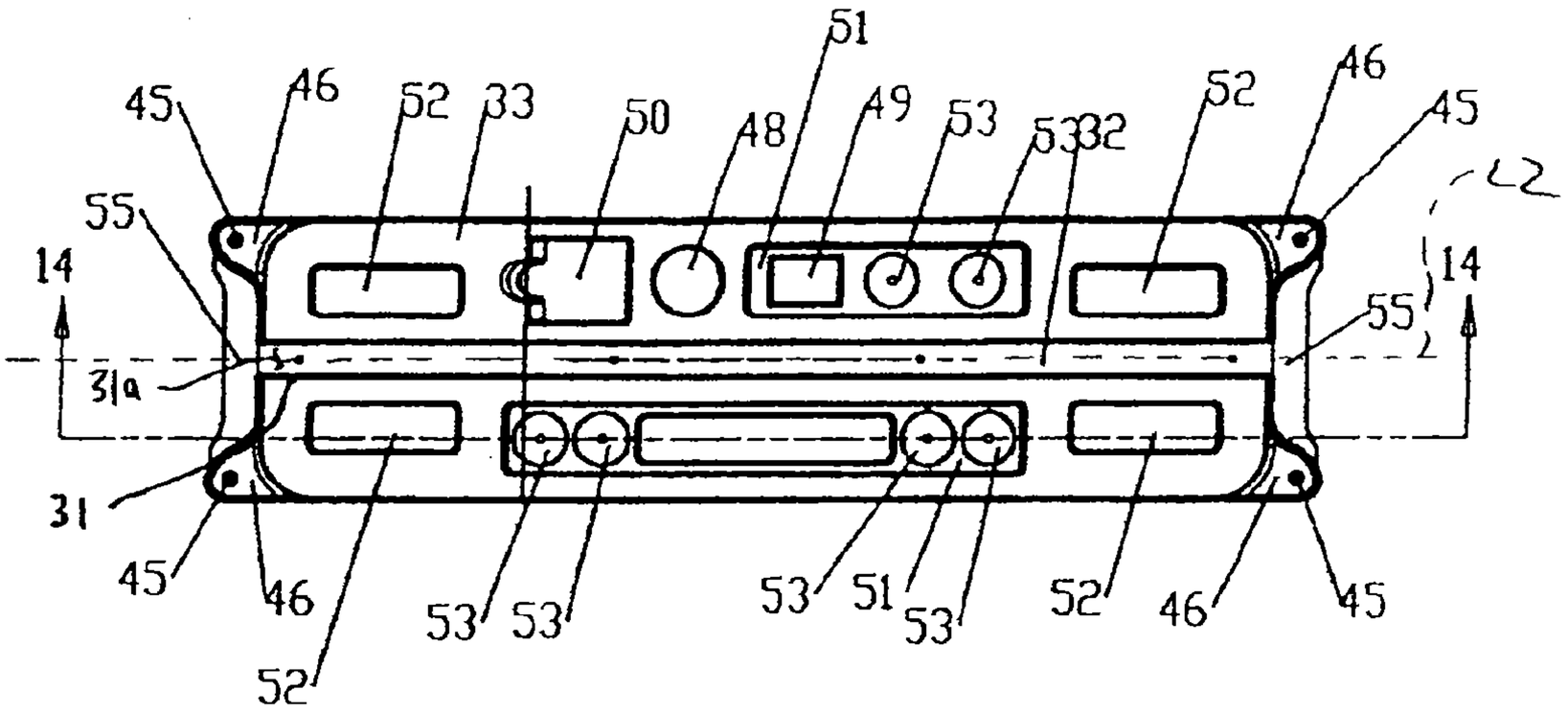

FIG. 13

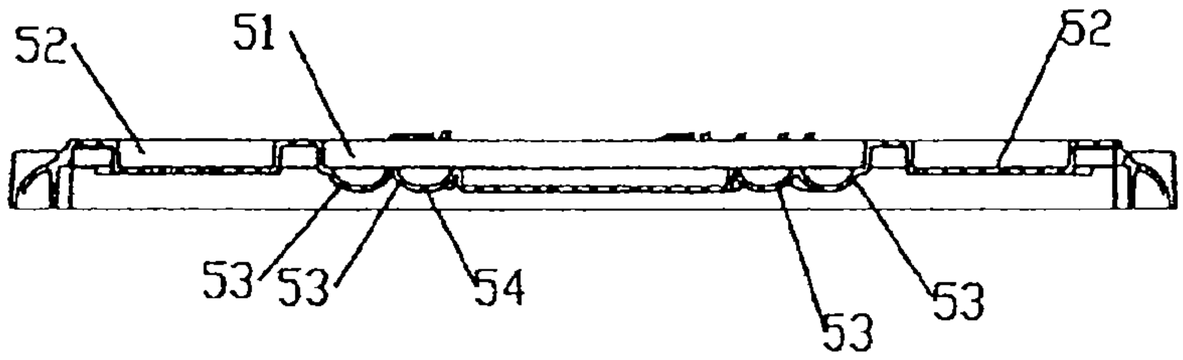

FIG. 14

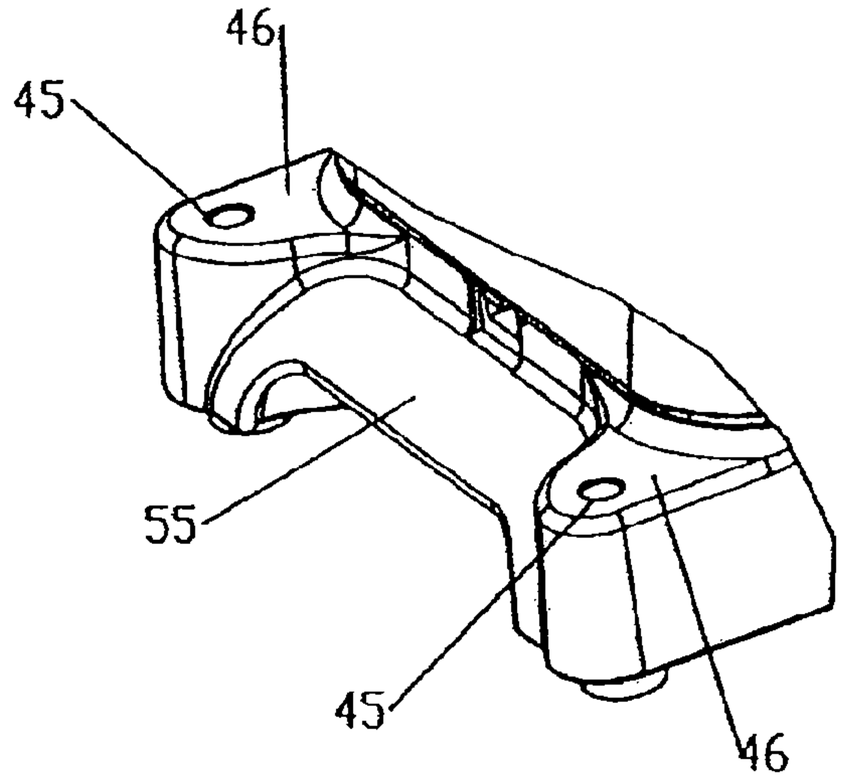

FIG. 15

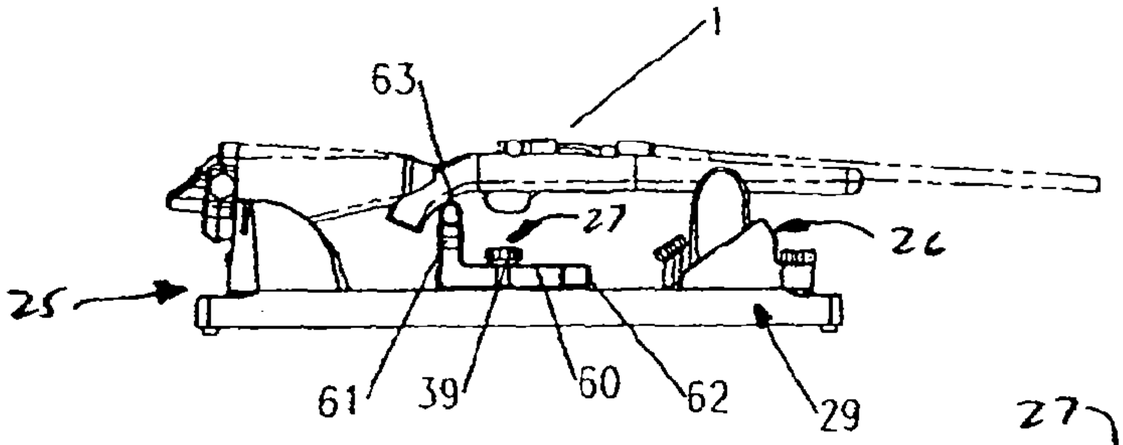

FIG. 16

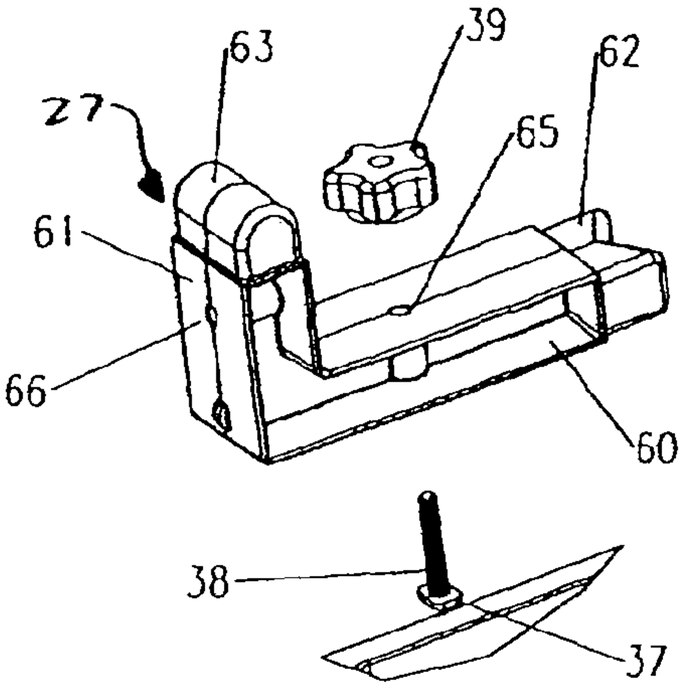

FIG. 17

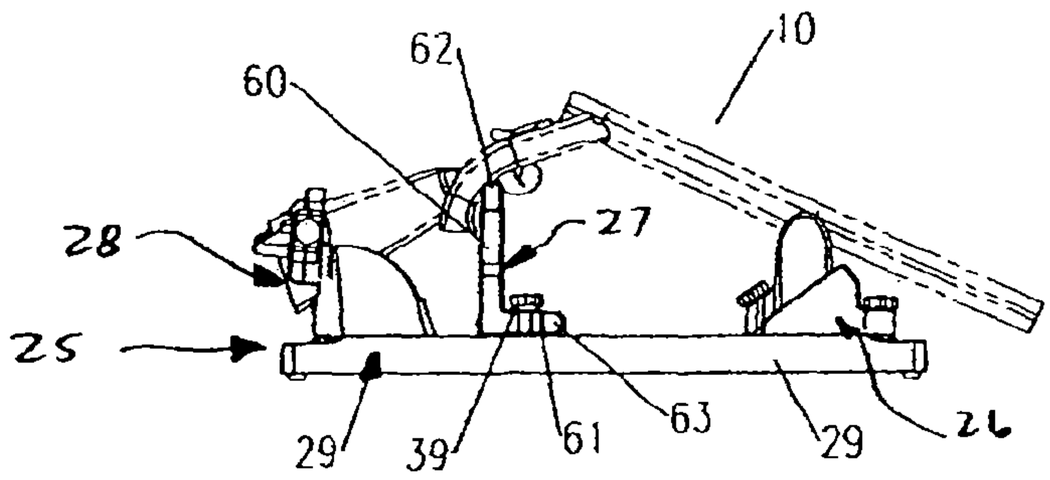

FIG. 18

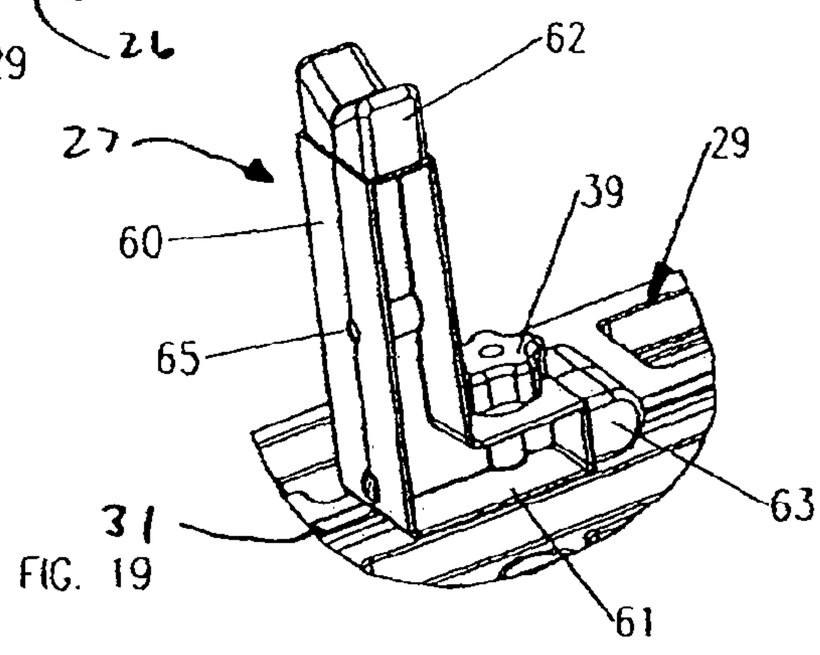

FIG. 19

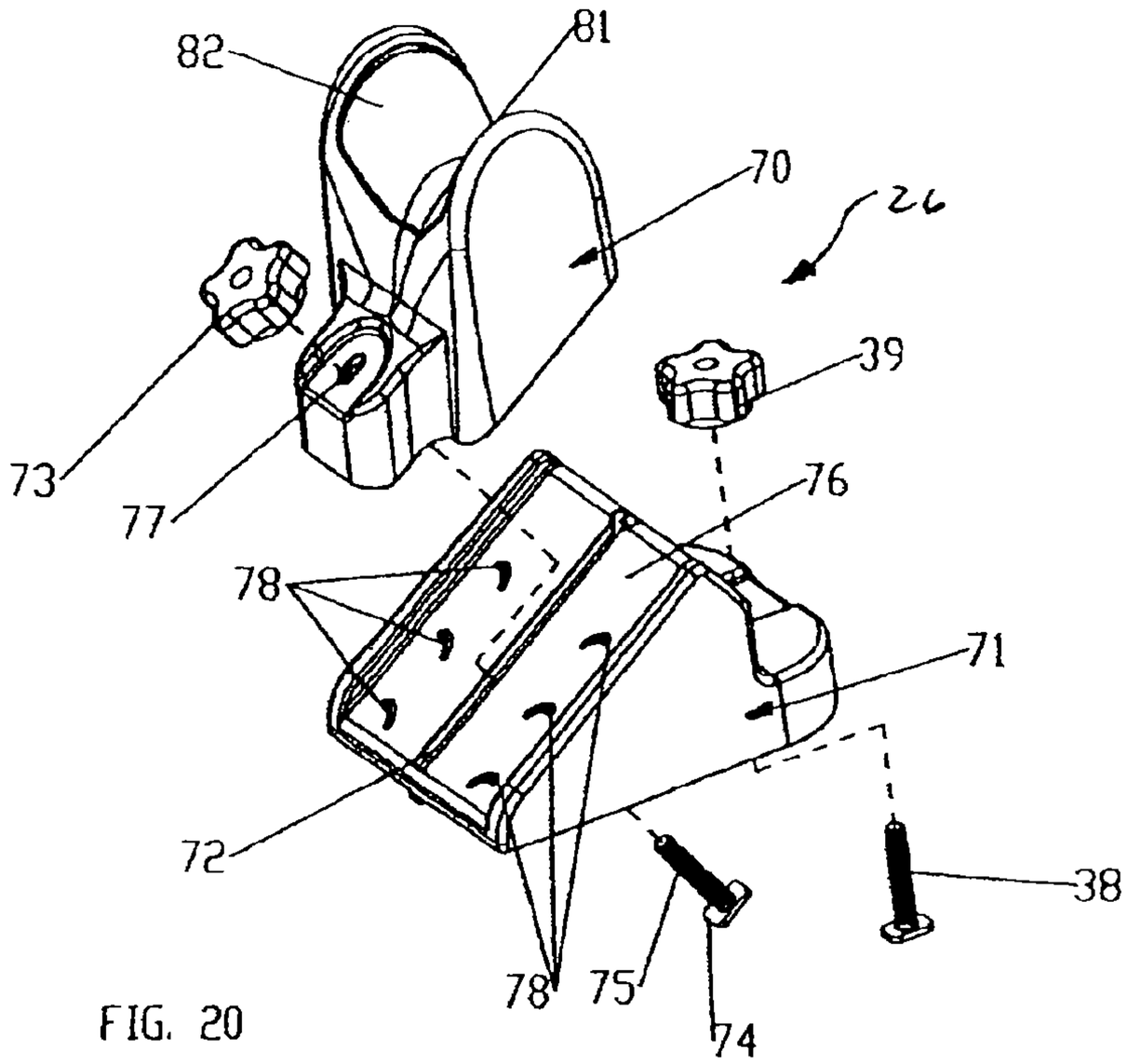

FIG. 20

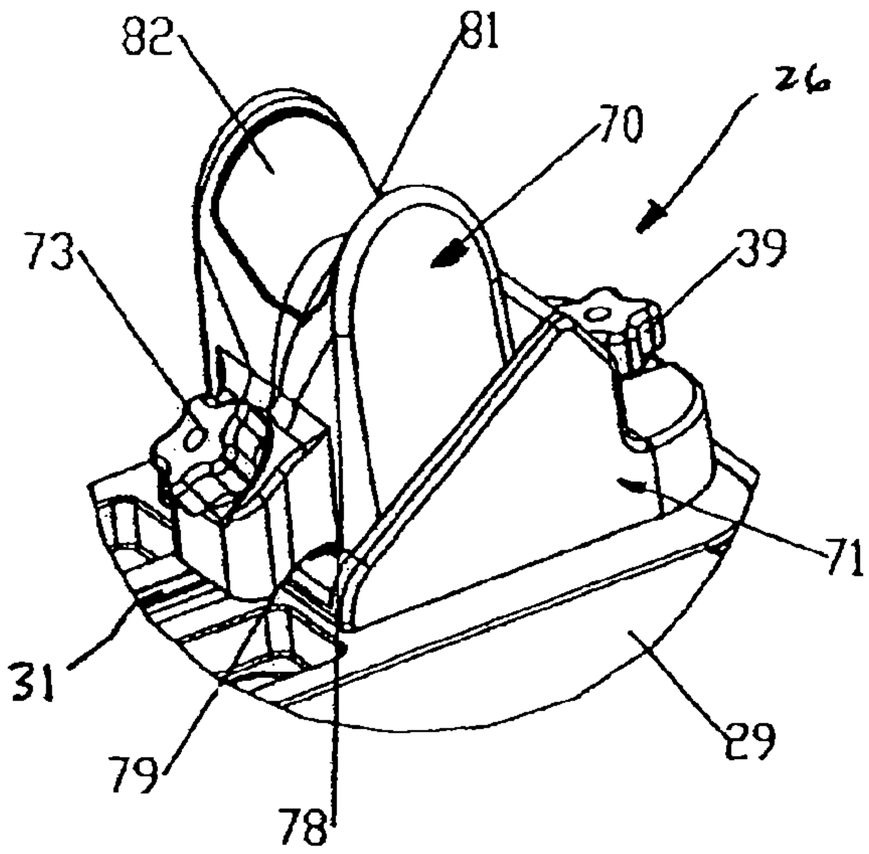

FIG. 21

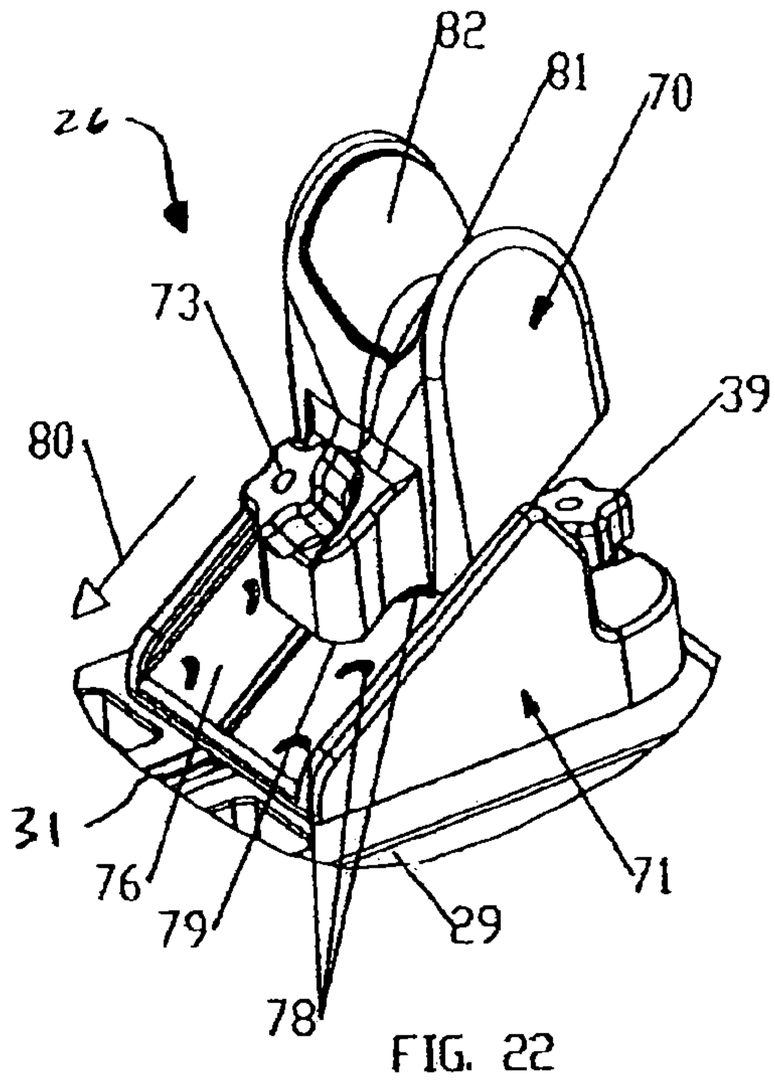

FIG. 22

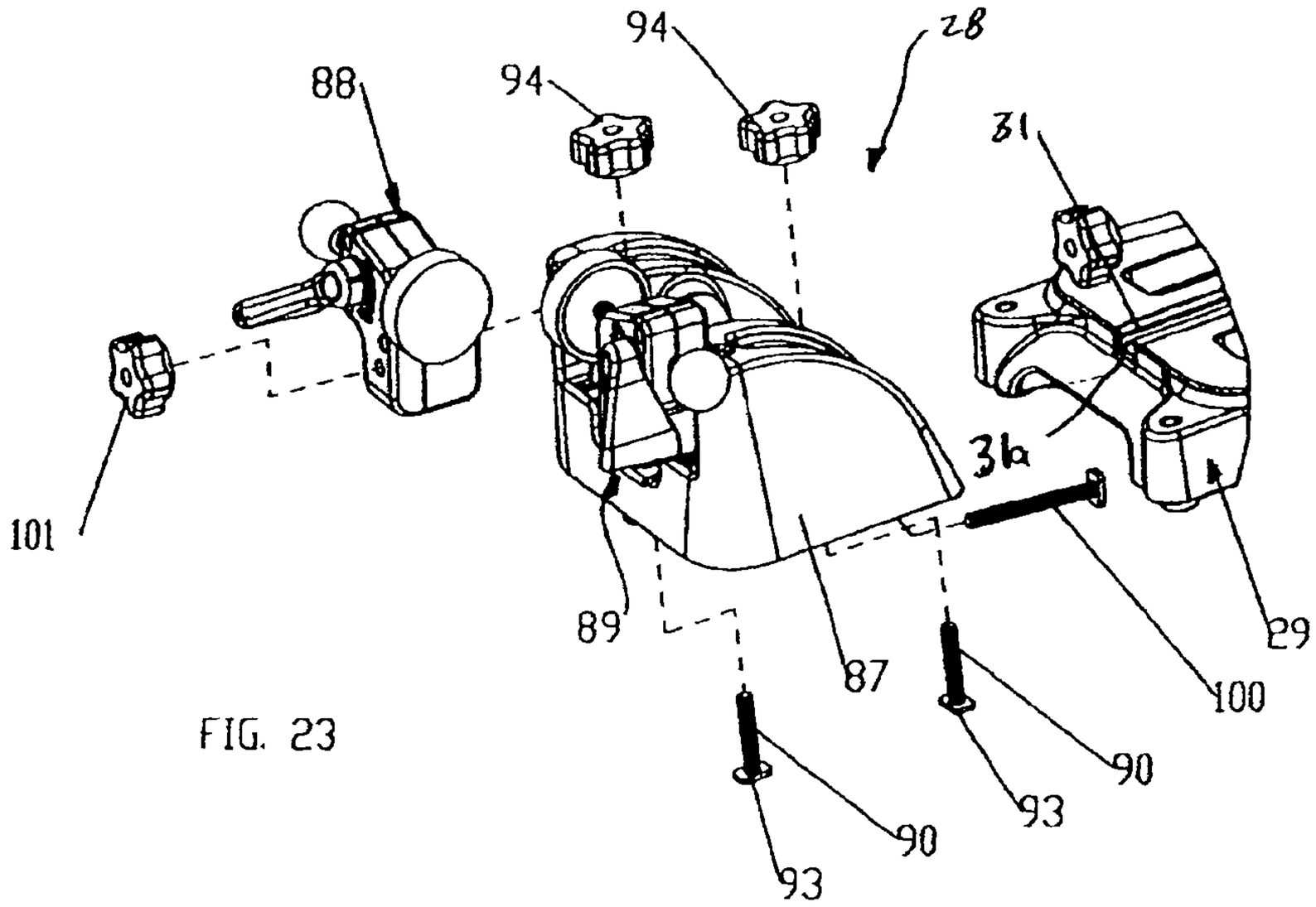
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FIG. 23

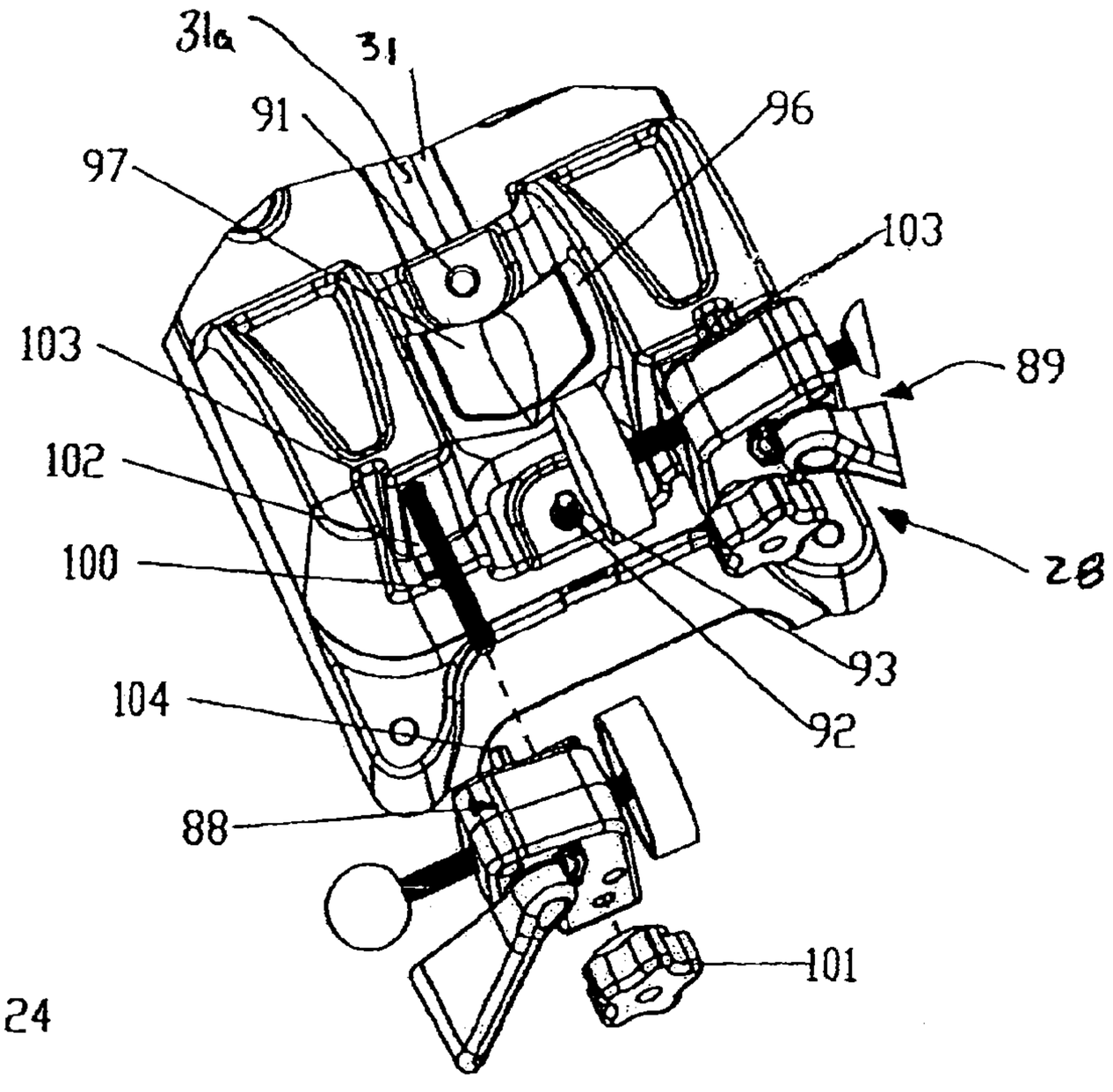
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FIG. 24

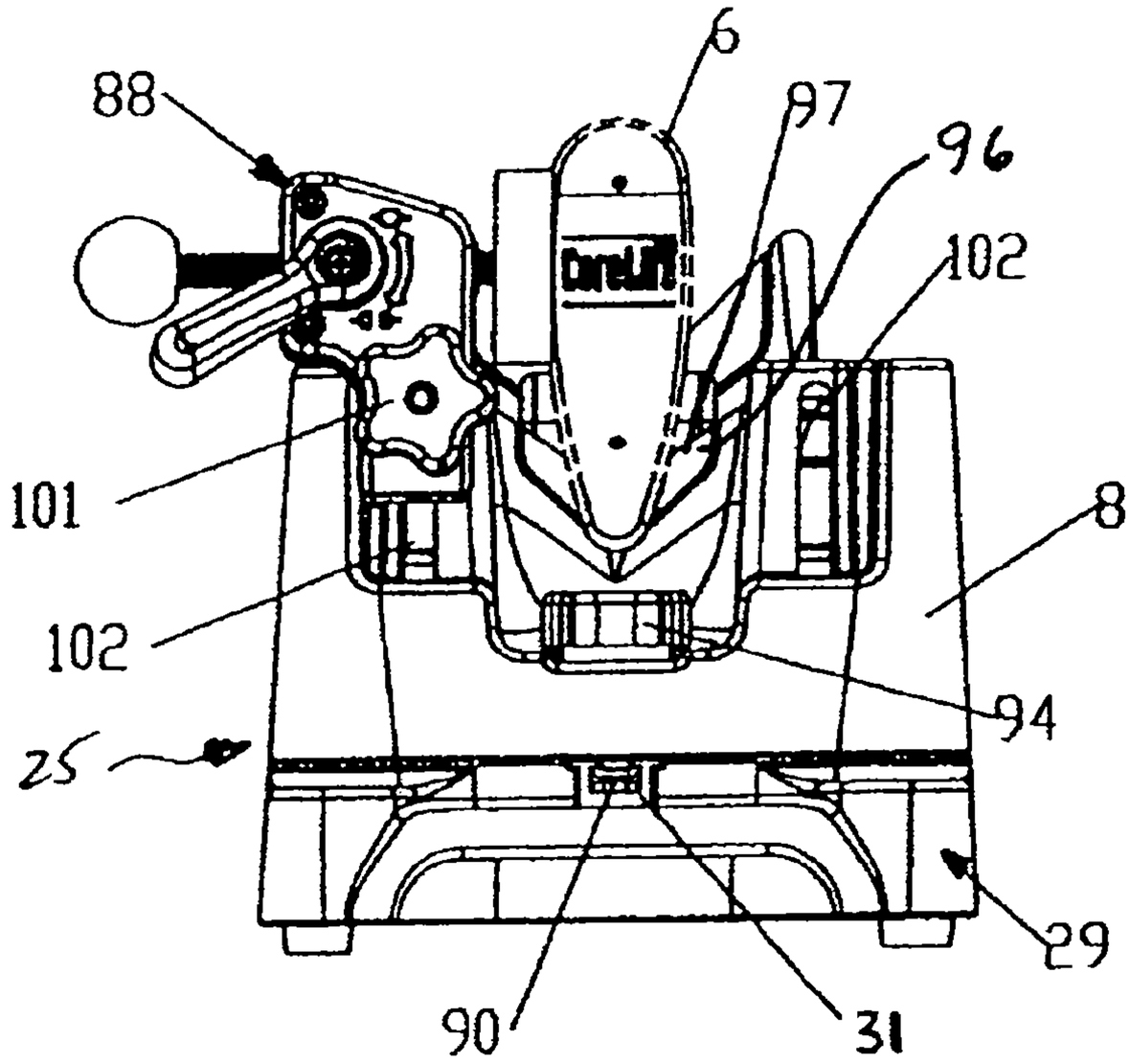
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FIG. 25

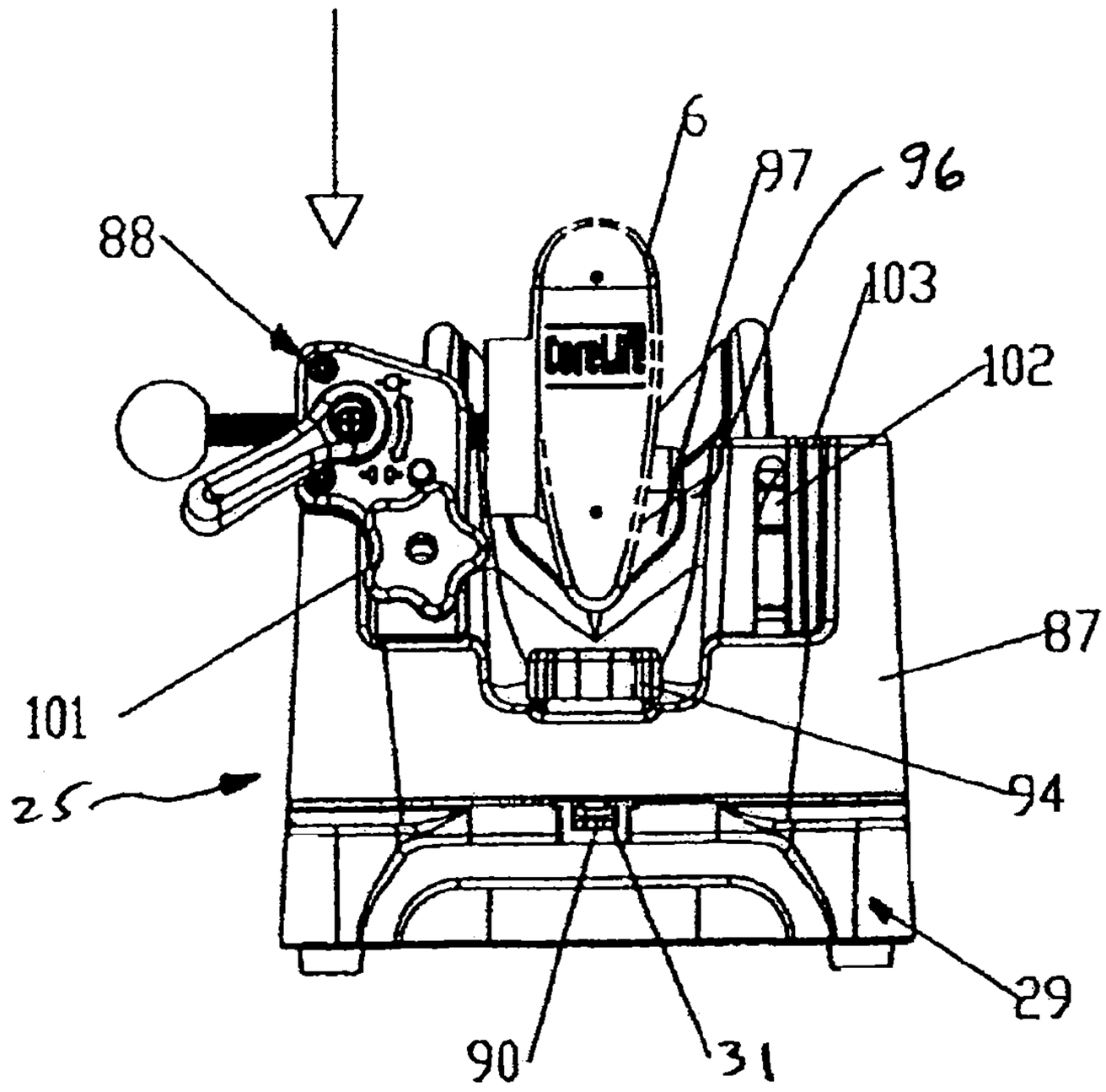
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FIG. 26

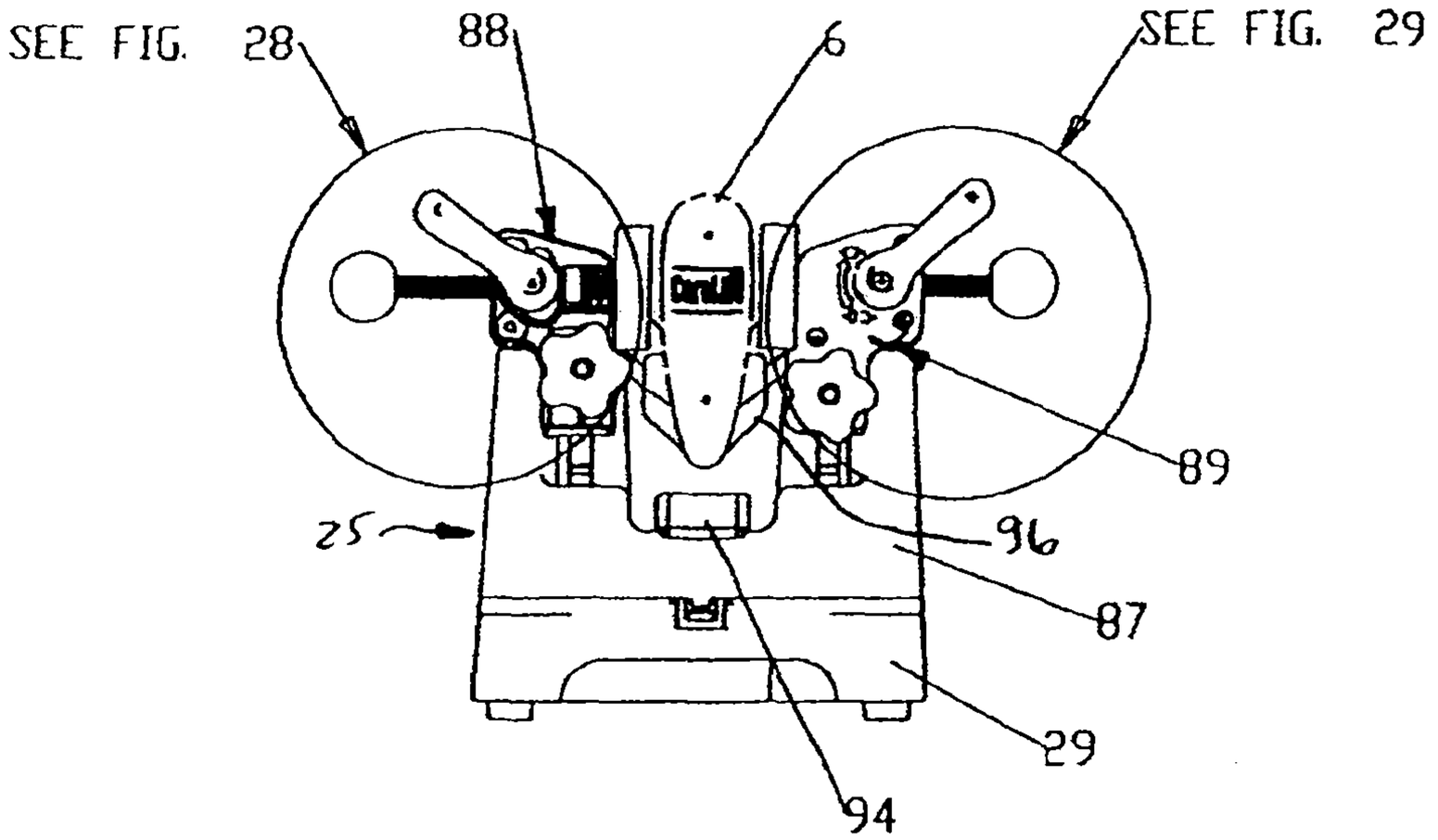

FIG. 27

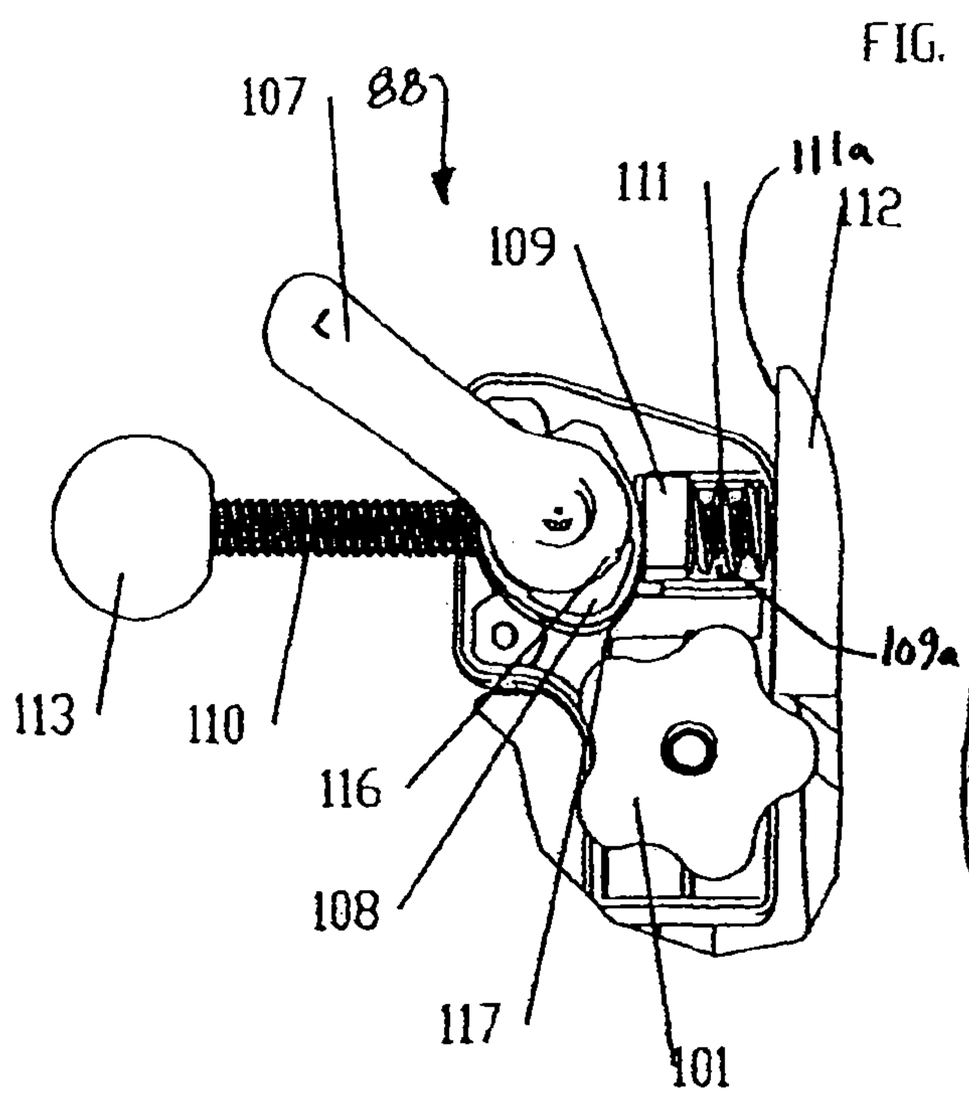

FIG. 28

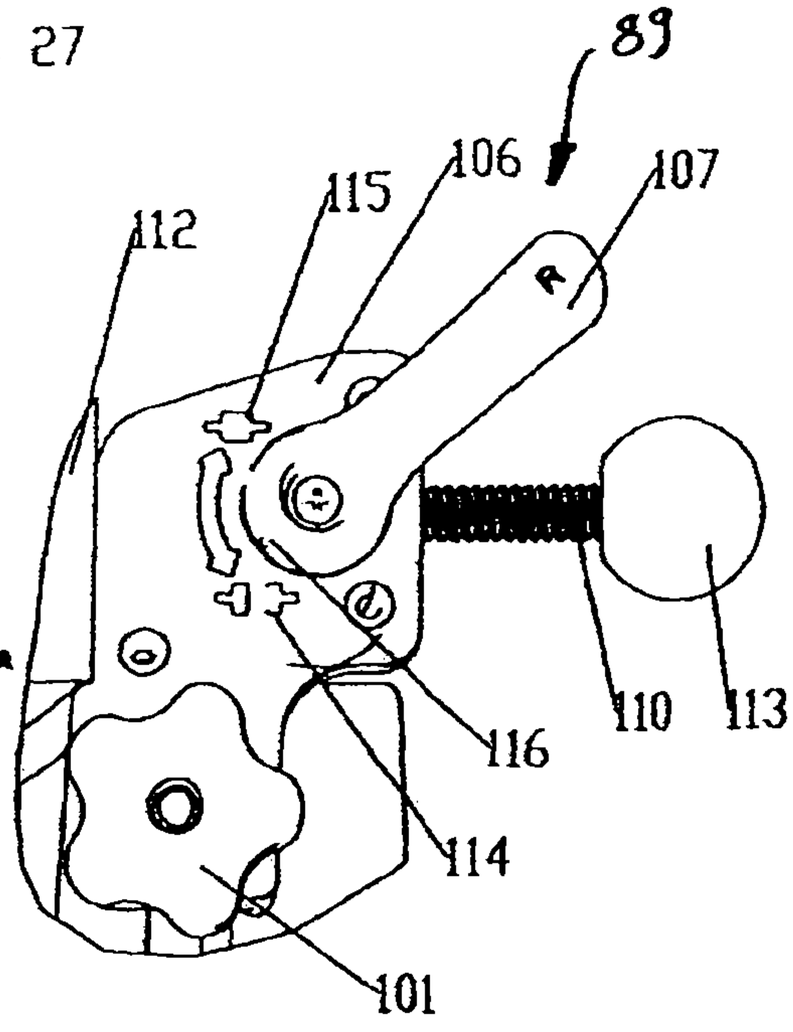

FIG. 29

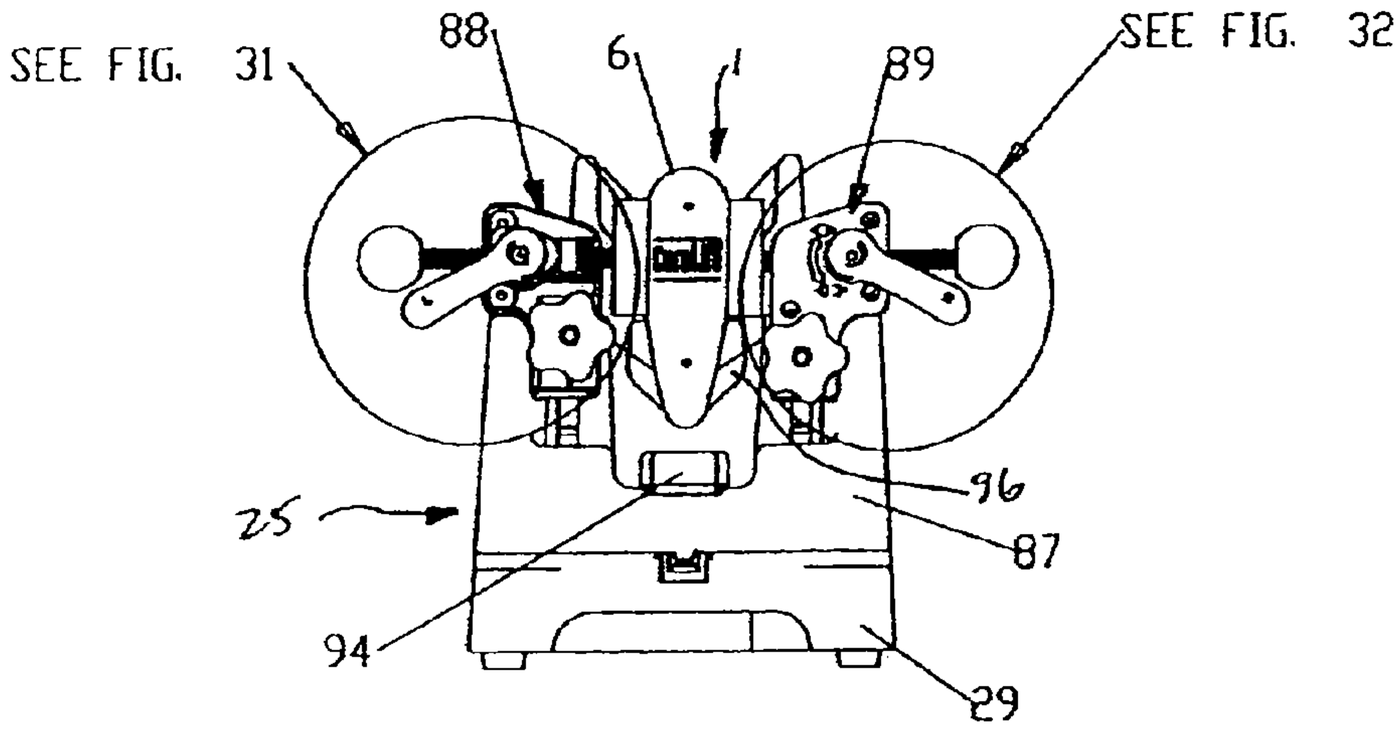

FIG. 30

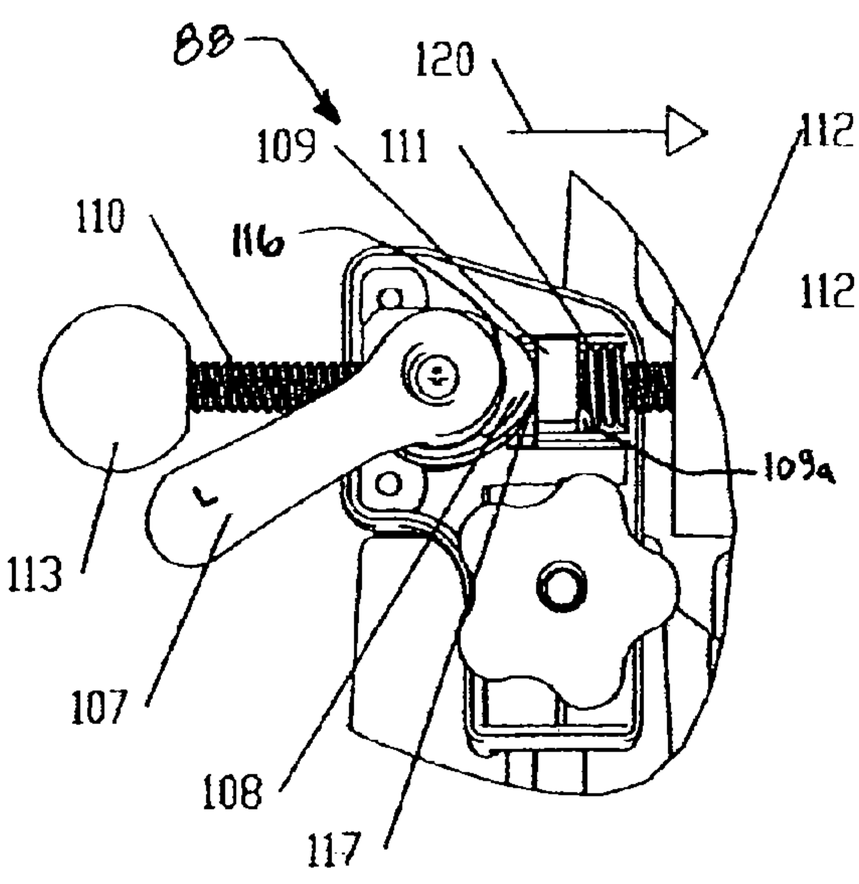

FIG. 31

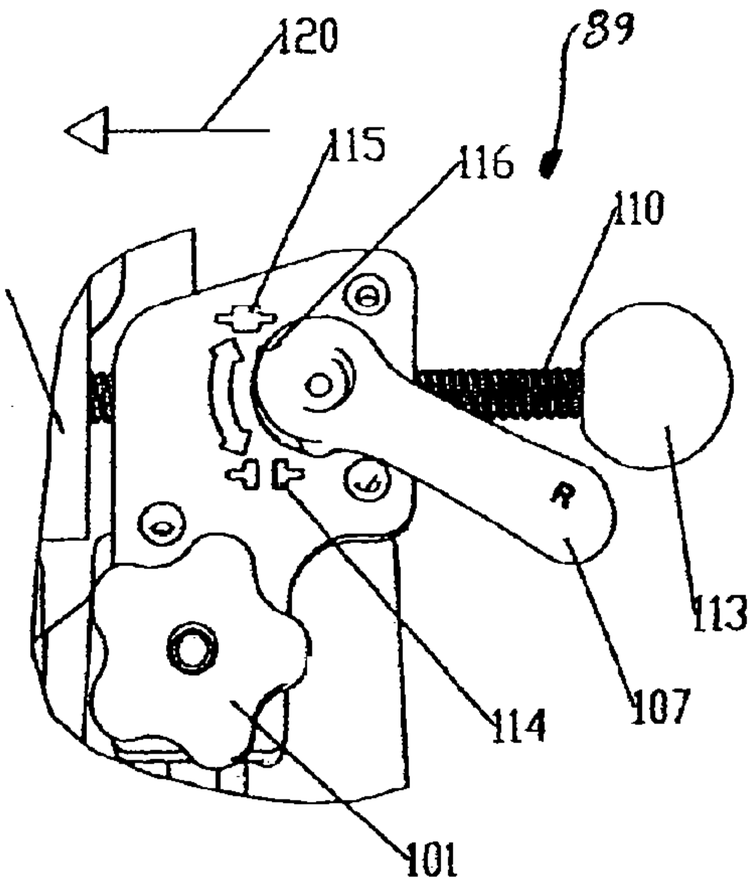

FIG. 32

FIREARM VISE

CROSS-REFERENCE TO RELATED APPLICATION(S)

The present application is a Continuation of U.S. application Ser. No. 11/271,100, filed Nov. 10, 2005, now U.S. Pat. No. 7,584,690, which claims priority to U.S. Provisional Patent Application Ser. No. 60/626,689, filed Nov. 10, 2004, the disclosures of which are incorporated herein by reference in their entirety.

BACKGROUND

This invention relates generally to a firearm holding device and more particularly to a device for securely holding a rifle or shotgun for cleaning, maintenance, minor repairs, or mechanical modification.

This invention allows both hands of the user to work with the firearm, as the invention alone will hold and support the firearm in a stable, secure position. In addition, the adjustable features of the various components of the invention enable the user to position virtually any type of rifle or shotgun securely in an optimal position.

Traditionally, a firearm such as a rifle or shotgun is either handheld during cleaning and maintenance or a standard metal machinist vise or shop vise is used to hold the firearm for cleaning or maintenance. While a shop vise can be used to secure a rifle or shotgun and is definitely more secure than holding the firearm with one hand, it has many potentially negative features. A standard metal vise has metal jaws or clamping surfaces that must be covered with a softer material to avoid damage to the metal or stock of a firearm. The jaw coverings frequently fall from the vise after installation or are not installed resulting in damage to the firearm from the metal jaws.

A traditional vise can be used to support a firearm by positioning the jaws of the vise so as to clamp the firearm at one point along the length of the firearm. A traditional vise does not hold and support a rifle or shotgun at points on both the forend and buttstock simultaneously. Since a standard vise must clamp on to the firearm at only one point, the pressure at this point to effectively hold and secure the firearm must often be so great that the stock or mechanism of the firearm can be damaged.

A standard vise has no compartments for holding cleaning supplies or other items used during normal maintenance, repair or modification of rifles or shotguns. Also, most vises sturdy enough to hold a rifle or shotgun are usually quite large and heavy and must be fixedly mounted and attached to a bench. Such fixedly mounted vises cannot be readily moved from one work area to another.

Therefore, there is a need for a firearm holding device that will hold and support a rifle or shotgun securely and without damage to the firearm. In addition, such a firearm holding device should support the firearm on or at two or more separate points along the longitudinal length of the firearm and it should provide for optimal positioning of many different designs of firearms for the task at hand. Also, there is a need for a firearm holding device that is lightweight and portable and that provides storage areas for holding maintenance and repair supplies.

SUMMARY

A firearm holding device of the present invention preferably provides at least two points of support along the longitudinal length of the firearm and allows a user to properly secure virtually any type or design of rifle or shotgun. In one embodiment, the firearm holding device uses non-marring synthetic materials to eliminate the possibility of damage to the stock or the mechanism of the firearm. The amount of clamping pressure applied by such holding device to the firearm can be adjusted and limited. The horizontal position of the firearm held in the firearm holding device can be regulated by the use of the various adjustable support components, preferably at the front, middle and rear of the firearm. A firearm holding device of the present invention can be permanently attached to a bench or it can be used as a portable workstation on the flat surface of any table or bench. The firearm holding device is relatively lightweight and can be moved easily from one area to another. One embodiment of a firearm holding device of this invention also incorporates numerous built in storage areas for materials and tools used in the cleaning and maintenance of rifles and shotguns.

In general, the present invention is directed to a firearm holding device for holding a firearm having a forend, a grip and a buttstock. The holding device comprising a base having a longitudinal axis, a forend support mounted on the base for supporting the forend of the firearm, a grip support mounted on the base for supporting the grip of the firearm, and a buttstock support mounted on the base for supporting the buttstock of the firearm. At least one of the forend support, grip support and buttstock support are moveable on the base along the longitudinal axis of the base to accommodate various sizes and types of firearms.

In another aspect, the present invention is directed to a firearm holding device for holding a firearm. The holding device comprises a base for mounting the device on a flat surface, a forend support moveably mounted on the base for supporting the firearm, a grip support moveably mounted on the base for supporting the firearm, and a buttstock support moveably mounted on the base for supporting the firearm. The forend support, grip support and buttstock support being moveable on the base to accommodate various sizes and types of firearms.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a typical bolt-action rifle.

FIG. **2** is a perspective view of a typical bolt-action rifle with the bolt removed.

FIG. **3** is a perspective view of a typical break open, double-barreled shotgun with the action closed.

FIG. **4** is a perspective view of a typical break open double barrel shotgun with the action open.

FIG. **5** is a right side perspective view of one embodiment of a firearm holding device of the present invention.

FIG. **6** is an exploded perspective view of the holding device of FIG. **5**.

FIG. **7** is a right side perspective view of a typical bolt-action rifle secured in the firearm holding device.

FIG. **8** is a left side perspective view of a typical bolt-action rifle secured in the holding device.

FIG. **9** is a right side perspective view of a typical break open shotgun secured in the holding device.

FIG. **10** is a left side perspective view of a typical break open shotgun secured in the holding device.

FIG. **11** is a right side elevation view of a typical bolt-action rifle secured in the holding device.

FIG. **12** is a cross-section taken along the plane **12-12** of FIG. **11**.

FIG. **13** is a top plan view of a base of the holding device.

FIG. **14** is a section view taken along the plane **14-14** of FIG. **13**.

FIG. **15** is a detail fragmentary perspective of one end of the base.

FIG. **16** is side elevation view of a typical bolt-action rifle secured in the holding device.

FIG. **17** is an exploded perspective of a grip support of the holding device.

FIG. **18** a side elevation view of a typical break open shotgun secured in the holding device.

FIG. **19** is a detail view of the grip support at an extended position.

FIG. **20** is an exploded perspective of a forend support of the holding device.

FIG. **21** is a fragmentary detail perspective of the forend support in a lowered position.

FIG. **22** is a view similar to FIG. **21** but showing the forend support in a raised position.

FIG. **23** is an exploded side perspective view of a buttstock support of the holding device.

FIG. **24** is an exploded fragmentary top perspective of the buttstock support.

FIG. **25** is a rear elevation view of the invention with a left buttstock clamp in a raised position and a right buttstock clamp removed.

FIG. **26** is a view similar to FIG. **25** but showing the left buttstock clamp in a lowered position.

FIG. **27** is a rear elevation view with the buttstock clamps in an open position, the left buttstock clamp being shown with a cover removed.

FIG. **28** is a detail view of a portion of FIG. **27**.

FIG. **29** is a detail view of a portion of FIG. **27**.

FIG. **30** is a view similar to FIG. **27** but showing the buttstock clamps in a closed position.

FIG. **31** is a detail view of a portion of FIG. **30**.

FIG. **32** is a detail view of a portion of FIG. **30**.

DETAILED DESCRIPTION

A firearm holding device of the present invention supports and secures a firearm (e.g., rifle, shotgun, or other firearm) with multi-point support for cleaning or maintenance. Two exemplary firearms that may be supported by the firearm holding device of the present invention include a bolt-action rifle **1** (FIGS. **1** and **2**) and a break open sporting shotgun **2** (FIGS. **3** and **4**). A typical bolt-action rifle **1**, as shown in FIG. **1**, is best secured for cleaning, maintenance, or minor repairs by support on at least two of the following three surfaces spaced along the longitudinal axis LI of the rifle: the stock forend **2**; the underside of the stock at a location **3** in front of the trigger guard **5** or at a location **4** behind the trigger guard either or both of these locations **3**, **4** being referred to herein as the "grip" G of the firearm; and preferably adjacent the rear of the buttstock **6**. Access to the interior **7** of the rifle **1** for cleaning is typically accomplished by removal of the bolt **8** (see FIG. **2**). Use of a traditional machinist, or bench vise (not shown), to clamp the rifle **1** between the jaws of the vice at any one of the above three locations (stock forend **2**, underside of stock **3**, grip G, or rear of buttstock **6**) spaced along the longitudinal length of the rifle may result in damage to the stock or the mechanism of the rifle due to the increased holding pressure that is required to support the rifle at a single point.

As shown in FIGS. **3** and **4**, a typical break open sporting shotgun **10** is hinged at the receiver **11** to provide access to the interior of the firearm. The break open shotgun **10** should be held in an open position (FIG. **4**) for cleaning in which the

receiver **11** is unlocked and the barrels **12** are pivoted away from the receiver **11**. With the barrels **12** unlocked and opened, as in FIG. **4**, the user will have access to the inside **13** of the barrels **12** for cleaning or maintenance. As with a bolt-action rifle **1**, support should be placed on the following surfaces along the longitudinal length of the shotgun **10**: the stock forend **16** or barrels **12**; the lower surface **17** in front of the trigger guard **19** or the surface **18** behind the trigger guard either or both of these locations **17**, **18** being referred to herein as the "grip" G of the firearm; and near the rear of the buttstock **20**. It is understood that the mechanisms of a typical bolt-action rifle **1** and a break open shotgun **10** are quite different and require different mechanical supports for optimal security and rigidity when performing routine maintenance and cleaning.

As shown in FIGS. **5** and **6**, one embodiment of the firearm holding device (gun vise), generally indicated **25**, includes four subsystems to provide the numerous positions necessary for supporting a wide range of rifles and shotguns, namely, a forend (front) support generally indicated **26**, a grip (center) support generally indicated **27**, a buttstock (rear) support generally indicated **28**, and a base generally indicated **29** having a longitudinal axis L**2** for mounting the vise on a flat surface. The forend support **26**, grip support **27** and buttstock support **28** are removably attached to the base **29** and may be translated longitudinally along the base **29** to alter their positions relative to each other.

FIGS. **7-10** compare the different positions of the vise **25** that are used to secure the bolt-action rifle **1** and the break open shotgun **10** for cleaning or maintenance. As shown in FIGS. **7** and **8**, the bolt-action rifle **1** is supported by contact with the vise **25** at three locations along the longitudinal length of the rifle. The forend support **26** contacts the stock forend **2** of the rifle **1**, the grip support **27** contacts the rifle at the grip G on the stock behind trigger guard **5**, and the buttstock support **28** contacts the rifle near the rear of the buttstock **6**. As shown in FIGS. **9** and **10**, the vise **25** is positioned to support the break open shotgun **10** at three points of contact located along the longitudinal length of the shotgun. The forend support **26** contacts the barrels **12** of the shotgun, the grip support **27** contacts the shotgun at the grip G behind the trigger guard **19**, and the buttstock support **28** contacts the shotgun near the rear of the buttstock **20**. As illustrated by the different positions required to support each firearm **1**, **10**, the vise **25** has a high-degree of adjustability that allows a wide range of firearms to be supported and secured by the vise.

The forend support **26**, grip support **27**, and buttstock support **28** are all removably attached to the base **29** and may be longitudinally translated along the base for optimum positioning for a specific firearm. As shown in FIGS. **12** and **13**, the base **29** has a top surface **33** and a recessed channel **32** extending the longitudinal length of the base. The channel **32** receives a retainer, generally indicated **31**, that has an elongate opening or slot **31***a* in the top surface of the base. As shown in FIG. **6**, the retainer **31** acts as a track along which the forend support **26**, the grip support **27**, and the buttstock support **28** may be positioned. In the illustrated embodiment, the retainer **31** is a separate part attached to the base **29** but it is understood that the retainer may be formed as an integral part of the base without departing from the scope of this invention.

As shown in FIG. **12**, the retainer **31** includes two spaced apart side walls **34** that have a T-shaped cross-sectional shape and a bottom wall **35** connecting the side walls. The retainer opening **31***a* has a bottom portion wider than an upper neck portion between the side walls **34**. The opening **31***a* in the

retainer **31** may have other shapes without departing from the scope of this invention. As shown in FIG. **12**, the bottom cavity of the opening **31***a* is sized to slidably receive a head **37** of a threaded bolt **38** to allow the bolt to slide along the length of the opening. The bolt **38** is restrained from being removed from the retainer **31** by the narrow neck portion of the opening **31***a*. A locking knob **39** removably retains the threaded bolt **38** in the forend support **26**. When the locking knob **39** is tightened the bolt **38** translates upward so that the bolt head **37** contacts the lower surface **40** of the upper portion of each side wall **34** that define the neck of the opening **31***a*. The contact of the bolt head with the surfaces **40** of the side walls **34** of the retainer **31** frictionally retains the forend support **26** at a desired longitudinal position on the base **29**. This method of retention and positioning the bolt **38** along the retainer **31** is common to the forend support **26**, the grip support **27** and the buttstock supports **28**. The retainer **31** and opening **31***a* extend the length of the base **29**, so that each of the individual supports **26**, **27**, **28** may be longitudinally positioned along the base or completely removed by sliding the bolt head **37** out of either open end of the retainer.

As shown in FIGS. **13-15**, the base **29** is generally rectangular and may be fabricated as a single unit, e.g., by plastic injection molding, so a majority of its features are integral to the part. In one embodiment, the base **29** is about 30 inches in length, about 7 inches wide, and about 1.5 inches tall. The base **29** serves as a platform for mounting the vise **25** to a bench or other suitable work surface. Holes **45** formed in each of the four corners of the base **29** provide clearance for bolts or screws to permanently mount the vise **25** to a work surface. Flat surfaces **46** around the holes **45** provide contact points for a C-clamp, or other user provided clamping device, to temporarily mount the unit to a work surface.

The top surface **33** of the base **29** contains numerous cavities, or depressions, of specific sizes and shapes corresponding to common firearm cleaning supplies and maintenance tools that aid in organization of the work area. For example, round cavities **48** are sized and shaped to receive round solvent bottles (not shown), and rectangular cavities **49** are sized and shaped to receive rectangular bottles and cleaning patches. Two pairs of rectangular storage cavities **52** at the ends of the base **29** are covered with the forend support **26** and buttstock support **27** when the vise **25** is assembled for supporting a firearm. The interior surfaces of the cavities may be stepped to provide additional organizational space by providing multiple layers of storage in a single cavity. As shown in FIG. **14**, the base has two elongate rectangular cavities **51** that have hemispherical depressions **53** that provide storage for small parts, such as screws, while longer tools may be stored directly above the depressions in the rectangular cavities. The hemispherical depressions **53** allow for easier small part retrieval than flat-bottomed cavities due to the part naturally resting at the lowest point in the cavity **54**. As shown in FIG. **15**, a contoured, relieved area on each end of the base **29** between the flat surfaces **46** provides an integral handle **55** to facilitate lifting of the vise **25**.

As shown in FIGS. **16-19**, the grip support **27** is designed to provide two possible heights for supporting a firearm either in front or behind the trigger guard. The grip support **27** has a generally L-shaped body having two legs **60**, **61** oriented 90 degrees relative to one another. In the illustrated embodiment the leg **60** is longer than the leg **61**. The grip support **27** is removably mounted to the base **29** with either the longer leg **60** or the shorter leg **61** in the vertical position. As shown in FIG. **19**, the longer leg **60** of the grip support **27** has a V-shaped support **62** that will center and secure the underside of the firearm. The V-shaped support **62** is particularly useful for holding firearms, such as break open shotguns **10** (FIG. **18**), that require elevation of the firearm mechanism for cleaning or maintenance. The shorter leg **61** has a rounded support face **63** for non-break open rifles and shotguns, such as the bolt-action rifle I (see FIG. **16**). Both the V-shaped face **62** of the longer leg **60** and the rounded face **63** of the shorter leg **61** are covered with a pliable, rubber-like material to prevent marring the firearm finish and provide a slip resistant contact surface.

The grip support **27** is removably attached to the base **29** via the retainer **31** and can be positioned at any longitudinal point along the base **29**. As shown in FIG. **17**, the grip support may be attached to the base by a threaded bolt **38** that passes through a hole **65** located in the center of the longer leg **60** of the grip support for attachment of the support with the longer leg in the horizontal position and the shorter leg **61** in the vertical position. The grip support **27** may be attached to the base with shorter leg **61** in the horizontal position and the longer leg **60** in the vertical position (FIG. **18**) by the bolt **38** passing through a hole **66** in the shorter leg and the bolt head that is received in the retainer **31**. A locking knob **39** is threadably engaged to the bolt **38** and secures the grip support at a desired longitudinal position when tightened. As previously discussed in reference to FIG. **12**, tightening the locking knob **39** will translate the bolt head **37** upward pressing the bolt head against the upper portion of the side walls **34** of the retainer **31** to frictionally retain the grip support **27** at the desired longitudinal position.

The grip support **27** is adjusted from its shorter height (FIG. **16**) to its taller height (FIG. **18**) by removing the threadably engaged locking knob **39** from the threaded bolt **38**, lifting the grip support **27** until the free end of the threaded bolt **38** is removed from the hole **65** in the longer leg **61**, then repositioning the grip support **27** so the threaded bolt **38** engages the hole **66** in the shorter leg **61**. The locking knob **39** is then rethreaded onto the threaded bolt **38** that now protrudes from the shorter leg **21** and is tightened to secure the grip support **27** on the base **29**. It is understood that the grip support **27** is adjusted from its taller height to its shorter height in a similar manner.

The forend support **26** is constructed to provide four possible height settings for supporting the forend or barrel of the firearm. As shown in FIG. **20-22**, the forend support **26** has a forend upper member, generally indicated **70**, releasably engaged to a forend base, generally indicated **71**. The forend upper member **70** and forend base **71** are releasably engaged via a locking knob **73** and a threaded bolt **75** having a head **74** that is slidably retained in a slot **72** in the top surface **76** of the forend base **71**. The threaded bolt **75** is inserted through a hole **77** in the forend upper member **70** and retained by the threadably engaged locking knob **73**. The forend support **26** is adjusted for height by loosening the locking knob **73** and translating the forend upper member **70** along the angled surface or ramp **76** of the forend base **71**. Three sets of arcuate protrusions, or elevation stops **78**, are formed in the angled surface **76** of the forend base **71**. The elevations stops **78** provide three separate elevation positions for the forend upper member **70**. As shown in FIGS. **21** and **22**, the elevation stops **78** are shaped to engage rounded corners of the forend base **71** to prevent the base from sliding down the top surface **76**. During use, the locking knob **73** and elevation stops **78** combine to resist downward translational movement in the direction of arrow **80** (FIG. **22**) of the forend upper member **70** relative to the forend base **71**. If desired, the user may attach the forend upper **70** directly to the base **29** by inserting the bolt head **74** of the bolt **75** in the retainer **31** in the base rather than the slot **72** of the forend base. This arrangement

provides the fourth, and lowest, height setting of the forend support **26**. The dual adjusting capability (i.e., longitudinal position and vertical height) of the forend support **26** allows the user maximum flexibility in properly supporting the barrel or forearm of virtually any rifle or shotgun.

The forend base **71** is removably attached to the base **29** via the retainer **31** and can be positioned at any longitudinal point along the base **29**. Referring to FIG. **12**, the threaded bolt **38** passes through a hole located in the center of the forend base **71** with the head **37** engaged with the retainer **31**. The locking knob **39** threadably receives the bolt **38** so that the bolt head **37** is forced upward in the opening **31***a* when the knob is tightened. At the tightened position, the bolt head contacts the lower surfaces **40** of the spaced apart side walls **37** of the retainer **31** so that the forend support **26** is frictionally retained at a desired longitudinal position on the base **29**.

The top surface **81** of the forend upper **70** is generally V-shaped to help prevent any side-to-side movement of a barrel of the firearm supported by the firearm vise **25** and to self-center the firearm with the vise. A pliable, resilient (e.g., rubber-like) material **82** covers the top surface **81** of the forend upper **70** to prevent marring the firearm finish and provides a slip resistant contact surface.

The firearm vise **25** of the present invention is designed to completely restrict the movement of a rifle or shotgun for cleaning or maintenance of the firearm. The forend support **26** and grip support **27** provide vertical support and restrict lateral movement of the firearm. The buttstock support **28** provides vertical support for the rear of the firearm and clamps the firearm buttstock to prevent longitudinal movement of the firearm.

As shown in FIGS. **23** and **24**, the buttstock support **28** comprises a buttstock base **87**, a left clamp assembly, generally indicated **88**, and a right clamp assembly, generally indicated **89**. The left clamp assembly **88** and right clamp assembly **89** mirror each other about the longitudinal center of the gun vise **25**. The buttstock support **28** is removably attached to the base **29** via the retainer **31** and can be positioned at any point along the longitudinal length of the base **29**. The buttstock support **28** is a attached to the base **29** in a similar manner as the forend support **26** and grip support **27**. The buttstock support **28** is attached to the base **29** by two threaded bolts **90** that pass through a respective front hole **91** and rear hole **92** located on the longitudinal centerline of the buttstock base **87**. Each bolt **90** has a head **93** that is received in the opening **31***a* of the retainer **31**. The buttstock support **28** is secured to the bolts **90** by two locking knobs **94** which have been removed from the bolts in FIG. **24** for clarity. Tightening each locking knob **94** will force a respective bolt head **93** upward in the opening **31***a* of the retainer **31** so that each head contacts the lower surface **40** (FIG. **12**) of the upper portion of each of the side walls **34** (FIG. **12**) that define the neck of the opening so that the buttstock support is secured to the base **29** at the desired longitudinal position.

The top surface **96** of the buttstock base **87** is "V" shaped to help prevent any side-to-side movement of the firearm buttstock and to self-center the firearm in the gun vise **25**. A pliable, rubber-like material **97** covers the top surface **96** of the buttstock base **87** to prevent marring the firearm finish and provides a slip resistant contact surface.

The clamp assemblies **88**, **89** maybe adjusted in the vertical and horizontal (lateral) directions relative to the longitudinal axis L**2** of the base **29** to accommodate a wide range of firearm buttstock designs. The two clamp assemblies **88**, **89** are independently adjustable for height (vertical location), width of clamping area (horizontal location), and clamping pressure. FIGS. **23** and **24** illustrate one clamp assembly **88** removed from the buttstock base **87**, but the other clamp assembly **89** is adjustable on the base in a similar manner as described herein. As shown in FIGS. **23** and **24**, each clamp assembly **88**, **89** is releasably retained to the buttstock base **87** via a threaded bolt **100** and locking knob **101**. The head of each threaded bolt **100** is retained in a respective vertical slot **102** in the rear surface of the buttstock base **87**. The threaded bolt **100**, and the clamp assembly **88**, may translate the length of the slot **102** for vertical adjustment of the clamp assembly **88**. Tightening the locking knob **101** frictionally retains the vertical position of the clamp assembly **88** with the buttstock base **87**. FIGS. **25** and **26** compare the left clamp at the highest vertical position (FIG. **25**) and the lowest vertical position (FIG. **26**). An open-ended channel **103** parallel and adjacent to the vertical adjustment slot **102** is designed to accept a mating protrusion **104** (FIG. **24**) on the clamp assembly **88**. The vertical protrusion **104** is received in the channel **103** to prevent the clamp assembly **88** from rotating on the buttstock base **87** as clamping pressure is applied.

As shown in FIGS. **28** and **29**, each clamp assembly **88**, **89** consists of a housing **106** (partially removed in FIG. **28**), a clamp lever **107**, a cam **108**, a threaded cam follower **109** slidably received in a cavity **109***a* of the housing, a threaded adjustor stud **110**, a return spring **111** acting at one end against the follower and at its opposite end against a surface **11***a* of the housing, a buttstock pad **112** and an adjustor knob **113**. Referring to FIG. **27**, a rear view of the gun vise **13** is shown with a rifle buttstock **6** positioned between the two clamp assemblies **88**, **89** shown in the open position with the buttstock pads **112** spaced away from the rifle buttstock. As shown in FIG. **29**, the housing **106** has an exterior surface that contains a graphical indicator mark **114** for illustrating the open position of the clamp assemblies **88**, **89** and a graphical indicator mark **115** illustrating the closed position of the clamp assemblies. The clamp lever **107** has a pointer **116** for pointing to the indicator mark **114**, **115** indicating the corresponding open and closed position of the buttstock pads **112**.

FIGS. **28** and **31** show the relative positions of the clamp lever **107**, cam **108**, cam follower **109** and adjustor stud **110** in the open position (FIG. **28**) and closed position (FIG. **31**) of the left clamp assembly **88**. The operation of the right claim assembly **89** is identical to the left clamp assembly **88** described herein. The front half of the housing **106** has been removed in FIGS. **28** and **31** for illustrative purposes. To actuate, or close, the clamp assembly **88**, the clamp lever **107** is pushed down to rotate the lever counterclockwise as viewed in FIG. **28**. The clamp lever **107** is rotationally connected to the cam **108** that rotates with the lever. The cam **108** has an eccentric surface **117** that contacts the follower **109**. When the lever **107** is rotated counterclockwise from the position shown in FIG. **28**, the eccentric surface **117** of the cam **108** pushes the cam follower **109** linearly toward the rifle buttstock **6**, in the direction of arrow **120** (FIG. **31**). The linear movement of the follower **109** compresses the return spring **111**. The follower **109** is threadably engaged to the adjustor stud **110** so that linear movement of the follower causes corresponding linear movement of the adjustor stud. The buttstock pad **112** is threadably mounted to the end of the adjustor stud **110** so linear movement of the adjustor stud (and follower **109**) causes corresponding linear movement of the buttstock pad **112**.

At the closed position of the clamp assemblies **88**, **89** illustrated in FIG. **30**, the buttstock pads **112** will contact the rifle **1** on each side of the buttstock **6** and exert a clamping force perpendicular to the buttstock for holding the rifle in a secure holding position. As shown in FIG. **32**, the pointer **116** of the clamp lever **107** points to the symbol **115** illustrating

the closed position of the vise **25**. Rotating the clamp lever **107** of the clamp assembly **88** in the clockwise direction as viewed in FIG. **31**, causes rotation of the cam **108** such that the follower **109** in contact with the eccentric surface **117** moves away from the buttstock **6** in a direction opposite to the arrow **120**. The return spring **111** biases the follower **109** against the eccentric surface **117** so that the follower, adjustor stud **110**, and buttstock pad **112** move to the open position when the lever **107** is returned to the position of FIG. **28**. It is understood that the lever **107** of the clamp assembly **89** is rotated in an opposite direction (i.e., counterclockwise as viewed in FIG. **29**) to move the right buttstock pad **112** to the open position.

The amount of pressure exerted by the clamp assemblies **88**, **89** may be adjusted by rotating the adjustor knob **113** clockwise or counterclockwise to adjust the position of the buttstock pad **112** in the closed position of the vise **25**. The adjustor knob **113** is attached to one end of the adjustor stud **110**, and the buttstock pad is attached at the other end of the adjustor stud. The follower **109** is threadably engaged with the adjuster stud and is slidably received in the cavity **109***a* (FIGS. **28**, **31**) of the housing so that the follower is rotationally restrained. Therefore, when the adjustor knob **113** and adjustor stud **110** are rotated, the adjustor stud and buttstock pad **112** will traverse linearly as shown by the directional arrows **120**, but the follower **109** remains in a fixed position in contact with the eccentric surface **117** of the cam **108**.

It is understood that the buttstock pads may comprise foam padding or other compressible material. The pressure exerted by the clamp assemblies **88**, **89** on the buttstock **6** is adjustable by turning the adjustment knob **113** so that the gap between the buttstock pads for receiving the buttstock is reduced. The reduced distance between the buttstock pads will cause the pads to compress after contacting the buttstock **6** when the levers **107** of the clamp assemblies **88**, **89** are positioned to close the vise **25**.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

When introducing elements of the present invention or the preferred embodiment(s) thereof, the articles "a", "an", "the" and "said" are intended to mean that there are one or more of the elements. The terms "comprising", "including" and "having" are intended to be inclusive and mean that there may be additional elements other than the listed elements.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. For example, the various components of the firearm holding device could have other configurations.

I claim:

1. A firearm supporting device for supporting a firearm with a first portion and a second portion spaced apart from the first portion, the supporting device comprising:

a planar base having a longitudinal axis and an interfacing groove along the longitudinal axis, the base being configured to rest on an external surface;

a first support coupled to the base and configured to carry the first portion of the firearm, wherein the first support is removably and movably coupled to the base such that the first support is selectively movable along the longitudinal axis; and

a second support movably coupled to the base and selectively movable between a first position and a second position spaced apart from the first position along the longitudinal axis, the second support being configured to carry the second portion of the firearm and selectively inhibit movement of the firearm along the longitudinal axis relative to the second support, wherein the second support is removably coupled to the base and wherein the second support comprises first and second clamp assemblies for inhibiting movement of the firearm along the longitudinal axis;

wherein the first support comprises a first section coupled to the base and a second section movably coupled to the first section, the second section including a support surface positioned to contact the first portion of the firearm; and

wherein the second section is selectively movable relative to the first section to adjust a first distance between the support surface and the base and a second distance along the longitudinal axis between the first and second supports.

2. The supporting device of claim **1** wherein:

the first support is removably and slideably coupled to the base along the interfacing groove; and

the second support is removably and slideably coupled to the base along the interfacing groove.

3. The supporting device of claim **1** wherein the first support is selectively movable along the interfacing groove.

4. A firearm supporting device for supporting a firearm with a first portion and a second portion spaced apart from the first portion, the supporting device comprising:

a planar base having a longitudinal axis and an interfacing groove along the longitudinal axis, the base being configured to rest on an external surface;

a first support coupled to the base and configured to carry the first portion of the firearm;

a second support movably coupled to the base and selectively movable between a first position and a second position spaced apart from the first position along the longitudinal axis, the second support being configured to carry the second portion of the firearm and selectively inhibit movement of the firearm along the longitudinal axis relative to the second support; and

a third support coupled to the base along the interfacing groove and positioned between the first and second supports, the third support being configured to carry a third portion of the firearm between the first and second portions.

5. A firearm supporting device for supporting a firearm with a first section and a second section forward of the first section, the supporting device comprising:

a base having a longitudinal axis and a track along the longitudinal axis;

a first support for carrying the first section of the firearm, the first support being coupled to the base at a position along the track; and

a second support for carrying the second section of the firearm, the second support including a first portion coupled to the base at a position along the track and a second portion movably coupled to the first portion, the first portion having a canted surface, the second portion including a support surface positioned to contact the second section of the firearm, wherein the second portion is selectively movable relative to the first portion to adjust the position of the support surface along the longitudinal axis and a distance between the support surface and the base.

6. The supporting device of claim 5 wherein the second support further comprises a retaining assembly for selectively inhibiting movement of the first portion relative to the second portion.

7. The supporting device of claim 5 wherein:

the base defines a plane;

the second portion further comprises a canted surface facing the canted surface of the first portion; and

the canted surfaces of the first and second portions are canted relative to the plane.

8. The supporting device of claim 5 wherein the first support comprises a clamping assembly for securing the firearm to the first support.

* * * * *